CDL Gateway™
Version 1.05
Installation and Operation Guide

SIMPLE SOLUTIONS. POWERFUL MONITORING.

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Introduction

The CDL Gateway™ is a completely new generation of communications interface from Monico. It does not require any intermediary devices to communicate with all engines that utilize the Data Link for primary communications. This includes the vast majority of industrial engines, marine engines, large construction and mining equipment engines, and generator sets that use the ADEM II & ADEM III ECM's, EIS, and AFR controls. The CDL Gateway™ is **NOT** an engine controller and is only used for monitoring engine and generator parameters.

Like our previous products, it will automatically interrogate the CDL and determine which controllers are present on the network. It will then poll all possible parameters to determine which parameters are present on that particular installation. All values are in pre-assigned registers to minimize setup time. It is our intention to always provide a product that requires little or no setup to function in a wide variety of applications. However, any of our programs are modifiable using MonicoView software which is available for download on our website at www.monicoinc.com. ***Make sure to check the website for the latest software revisions before installation.*** The major features are listed below:

- The CDL Gateway™ is much faster than the CCM Translator, which is used only in conjunction with the CCM Module
- The CDL Gateway™-Modbus Version offers Modbus RTU over Serial RS-232 and RS-485 as well as Modbus TCP/IP over Ethernet. All ports are available on the same unit
- The CDL Gateway™ has a User Interface via a USB connection that allows you to configure the ports and see exactly which parameters are responding on your installation.
- The CDL Gateway™ has an integral 24 VDC Power Supply
- The CDL Gateway™ is designed to be mounted on Din-Rails, so no adapters are needed
- The CDL Gateway™ uses modular jacks for connections which minimizes wiring errors, especially when using our optional factory cables
- The CDL Gateway™ does not require complicated address offsets.
- The CDL Gateway™ does not require complicated Enable/Disable Masks as all parameters are default enabled. If necessary, the user can deactivate individual registers or ports via the User Interface, but due to the drastic increase in speed it should not be necessary for monitoring purposes
- The CDL Gateway™ allows for other host protocols such as BACnet and can push parameters directly to Allen Bradley Data Registers or Controller Tags, GE Fanuc Analog Input Registers, and Siemens Data Blocks via RS-232, RS-485, and Ethernet. Special instructions for these versions are covered in the appendix sections of this manual.

As always, you can count on Monico's "No Questions Asked" support policy. We are committed to timely support of every customer who contacts us for help regardless of where the gateway was purchased. The only thing that matters to Monico is a successful installation.

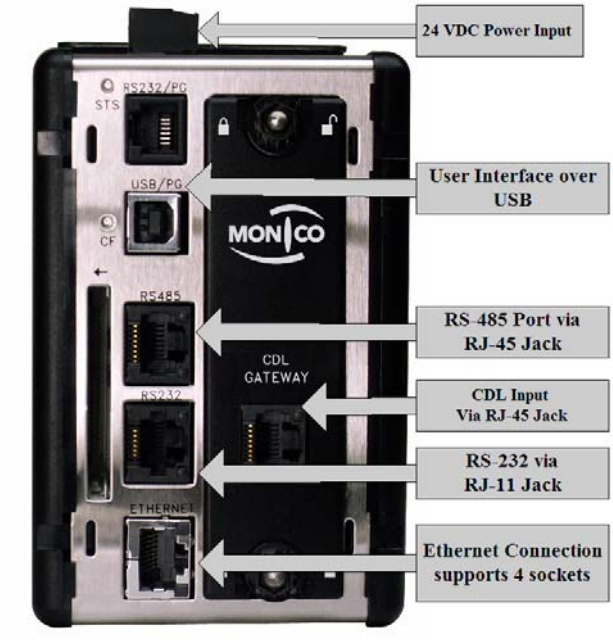
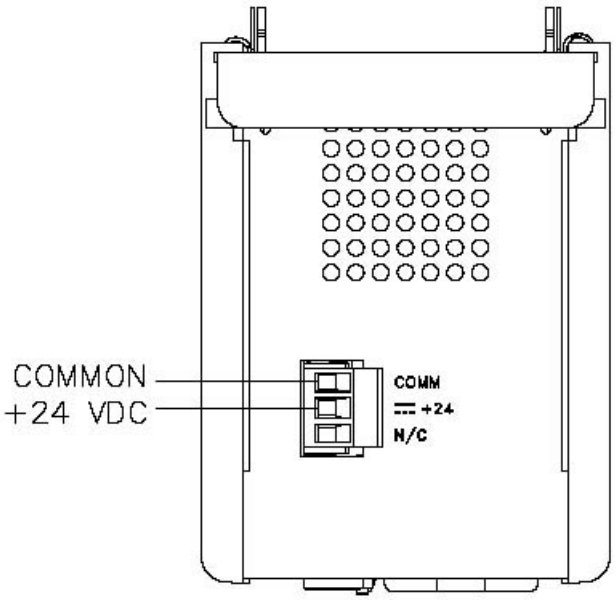


Figure 1.0 Gateway Connections Overview

Section 1: Power Supply

The CDL Gateway™ requires regulated 24 Vdc +/- 10% with 1000 ma power maximum. Must use Class 2 or SELV rated power supply. ***You may use either an Isolated power supply, or the properly grounded engine batteries to power the Gateway. If using an isolated power supply, make sure to use CDL Monitor 2.0. If power is applied, the green STS light will function. If this light is blinking, then no setup file is installed or it is currently loading a file. If this light is solid, then a setup file is resident and operating.***

POWER CONNECTION



CAUTION

Reversing wire polarity may cause damage to your Gateway. This damage is not covered by warranty. If in doubt about which wire is which on your power supply, check with a meter.

If you must use an external power supply, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

– The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the Gateway. Ideally, the shortest length possible should be used. The wire used to connect the Gateway's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.

– A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

EMC INSTALLATION GUIDELINES

Although the CDL Gateway™ is designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

1. To reduce the chance of noise spikes entering the unit via the power lines, connections should be made to a clean source. Connecting to circuits that also power loads such as contactors, relays, motors, solenoids etc. should be avoided.
2. The unit should be mounted in a metal enclosure, which is properly connected to protective earth.
3. Use shielded (screened) cables for all Signal and Control inputs. The shield (screen) pigtail connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
    a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.
    b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.
    c. Connect the shield to common of the Data Station and leave the other end of the shield unconnected and insulated from earth ground.
4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run through metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter. Also, Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
5. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
6. In extremely high EMI environments, the use of external EMI suppression devices is effective. The following EMI suppression devices (or equivalent) are recommended:
    Ferrite Suppression Cores for signal and control cables:
    Fair-Rite part number 0443167251 (RLC part number FCOR0000)
    TDK part number ZCAT3035-1330A
    Steward part number 28B2029-0A0
    Line Filters for input power cables:
    Schaffner part number FN610-1/07 (RLC part number LFIL0000)
    Schaffner part number FN670-1.8/07
    Corcom part number 1 VR3

SPECIFICATIONS

1. **POWER**: 24 VDC ± 10%
200 mA min., without expansion card
1 Amp maximum with expansion card fitted
Must use Class 2 or SELV rated power supply.
2. **COMMUNICATIONS**:
USB/PG Port: Adheres to USB specification 1.1. Device only using Type B connection.
Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
RS232/PG Port: RS232 port via RJ12
COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12
DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
Ethernet Port: 10 BASE-T / 100 BASE-TX
RJ45 jack is wired as a NIC (Network Interface Card).
3. **LEDs**:
STS – Status LED indicates condition of Data Station.
TX/RX – Transmit/Receive LEDs show serial activity.
Ethernet – Link and activity LEDs.

CF – CompactFlash LED indicates card status and read/write activity
4. **MEMORY**:
On-board User Memory: 4 Mbytes of non-volatile Flash memory.
On-board SDRAM:
DSPSX: 2 Mbytes
DSPGT: 8 Mbytes
Memory Card: CompactFlash Type II slot for Type I and Type II cards.
5. **REAL-TIME CLOCK**: Typical accuracy is less than one minute per month drift. Crimson 2.0's SNTP facility allows synchronization with external servers.
Battery: Lithium Coin Cell. Typical lifetime of 10 years at 25 ºC.
A "Battery Low" system variable is available so that the programmer can choose specific action(s) to occur when the battery voltage drops below its nominal voltage.
6. **ENVIRONMENTAL CONDITIONS**:
Operating Temperature Range: 0 to 50°C
Storage Temperature Range: -30 to +70°C
Operating and Storage Humidity: 80% max relative humidity, non-condensing, from 0 to 50°C
Vibration According to IEC 68-2-6: 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2 g's.
Shock According to IEC 68-2-27: Operational 30 g, 11 msec in 3 directions.
Altitude: Up to 2000 meters
7. **CONSTRUCTION**: Case body is burgundy high impact plastic and stainless steel. Installation Category I, Pollution Degree 2.
8. **POWER CONNECTION**: Removable wire clamp screw terminal block.
Wire Gage Capacity: 24 AWG to 12 AWG
Torque: 4.45 to 5.34 in/lb (0.5 to 0.6 N-m)
9. **MOUNTING**: Snaps onto standard DIN style top hat (T) profile mounting rails according to EN50022 -35 x 7.5 and -35 x 15.
10. **CERTIFICATIONS AND COMPLIANCES**:
SAFETY
C-UL Class I Division II Groups A-D Approved for Hazardous Locations
UL Listed, File #E317425, ANSI/ISA12.12.01-2007, CSA22.2 No. 213-M1987
LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
UL Listed, File #E302106, UL508, CSA 22.2 No. 14-M05
LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
ELECTROMAGNETIC COMPATIBILITY
Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.
Notes:
1. Criterion A: Normal operation within specified limits.
2. This device was designed for installation in an enclosure. To avoid electrostatic discharge to the unit in environments with static levels above 4 kV precautions should be taken when the device is mounted outside an enclosure. When working in an enclosure (ex. making adjustments, setting jumpers etc.) typical anti-static precautions should be observed before touching the unit.
11. **WEIGHT**: 15.1 oz (456.4 g)
Immunity to Industrial Locations:
Electrostatic discharge EN 61000-4-2 Criterion A 2
4 kV contact discharge
8 kV air discharge
Electromagnetic RF fields EN 61000-4-3 Criterion A
10 V/m
Fast transients (burst) EN 61000-4-4 Criterion A
2 kV power
2 kV signal
Surge EN 61000-4-5 Criterion A
1kV L-L,2 kV L&N-E power
RF conducted interference EN 61000-4-6 Criterion A
3 V/rms
Emissions:
Emissions EN 55011 Class A

Section 2: Hardware Installation

DIN rail should be mounted horizontally so that the unit's ventilation holes are vertical in relation to cabinet orientation. A minimum clearance of 1 inch (25.4 mm) should be maintained above and below the unit in order to ensure proper thermal regulation.

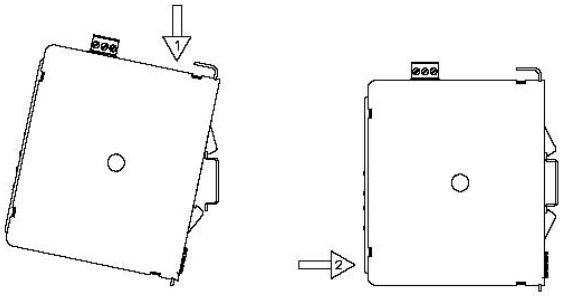


Figure 1 - Attach Data Station To DIN Rail

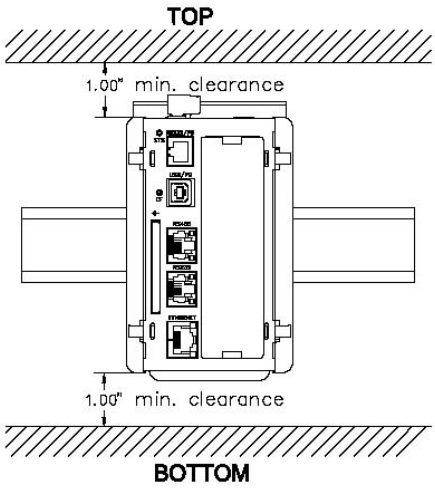


Figure 2.1 Hardware Installation

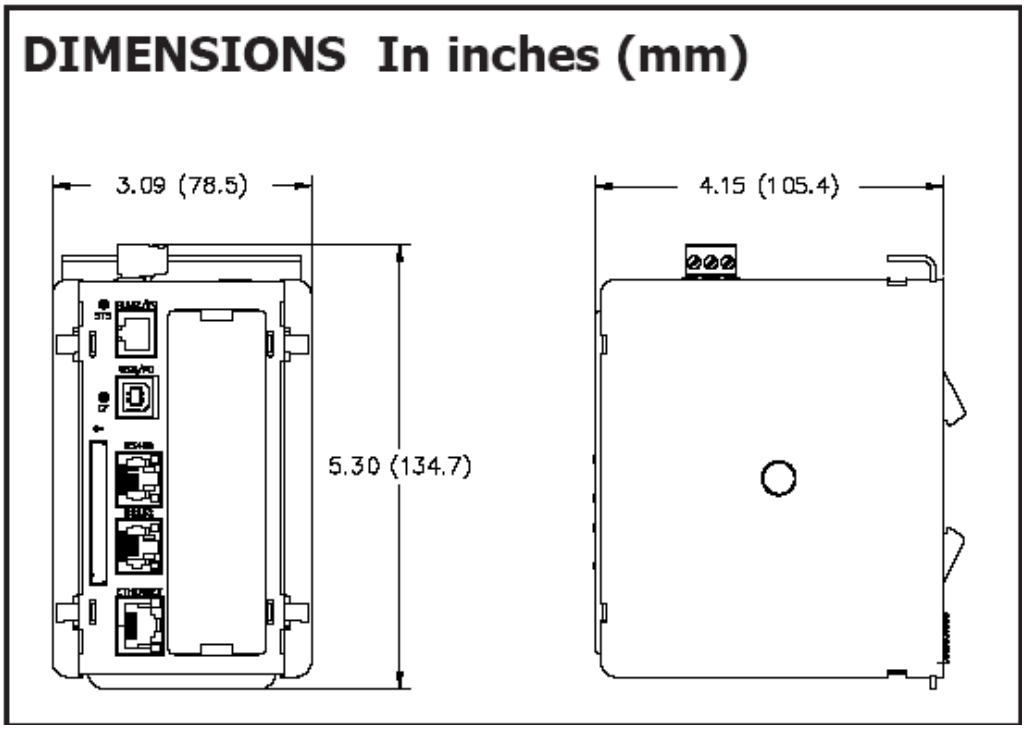


Figure 2.2 Hardware Dimensions

Section 3: CDL Connection to the Engine

Connection to the Data Link is via the RJ-45 Jack (Figure 3.1). The CDL is a differential buss that is relatively noise immune, but care must be taken not to create ground loops and good wiring practices are critical. This RJ-45 port has built-in receive (Rx-red) and transmit (Tx-Green) LED lights which will show transmit and receive activity. If there is no action with these lights after 5-10 seconds, then the Data Link is not active or not present. ***Please note that the Caterpillar panel must be powered on for the data link to be active.*** If the Rx light is on solid, then the CDL connections are reversed or the cable length is too long. If the cable is too long, you may need to add a resistor across the terminals on the CDL Gateway™ side of the connection to lower the cable impedance. Before trying this, consult the factory. **Be sure the Gateway is powered using and isolated 24 VDC source and the EMC wiring guidelines listed in Section 1 are followed or the properly grounded engine batteries.**

Figure 3.1 CDL Connection Pin #7=CDL (+); Pin#8=CDL (-)

Section 4: CDL Gateway™ Host Connections

The Host device (PLC, HMI, Building Management System, etc.) is connected to the Gateway through one of three host ports. The Gateway offers one RS 232 port (RJ-11 Jack); one RS-485 port (RJ-45 Jack) and one Ethernet Port (RJ-45 Jack-Shielded).

Host Connection-RS-232 via RJ-11 Jack

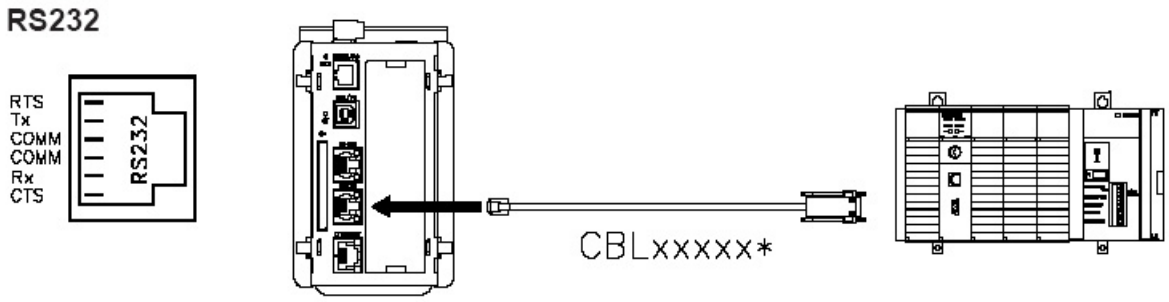


Figure 4.2 RS-232 Connections

Host Connections-RS-485/RS-422 via RJ-45 Jack

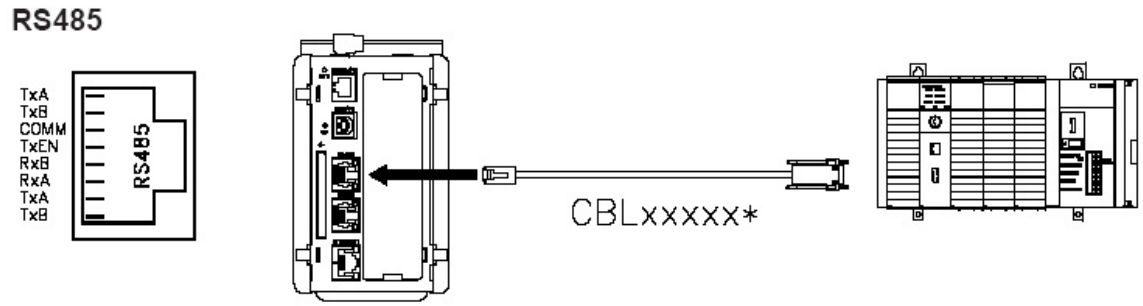


Figure 4.3 RS-485/RS-422 Connections

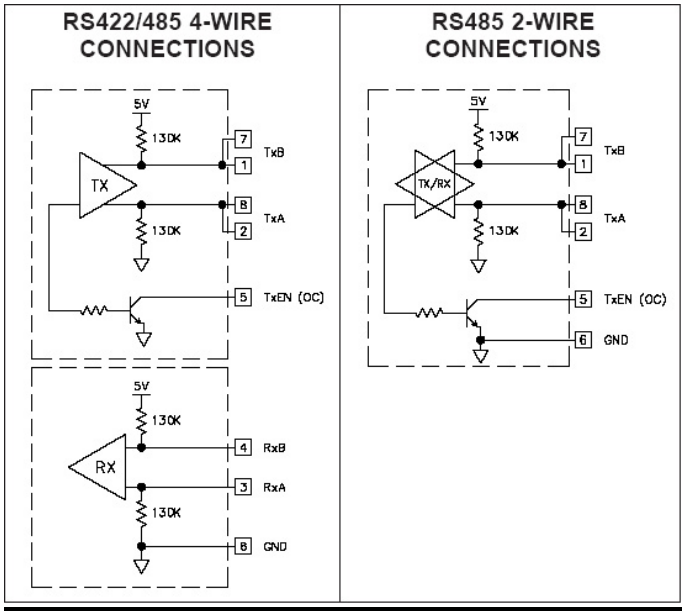


Figure 4.3 RS-485/RS-422 Schematic

Please note that different companies use different terminology. For example, some use TxA and TxB to describe 2- wire RS-485 connections. Some use Tx+ and Tx-. In general. TxA=Tx- and TxB=Tx+
For ***2-wire RS-485, use Pin#7 = (+) and Pin#8 = (-).***

Host Connections-TCP/IP over Ethernet via RJ-45 Shielded Jack

Ethernet

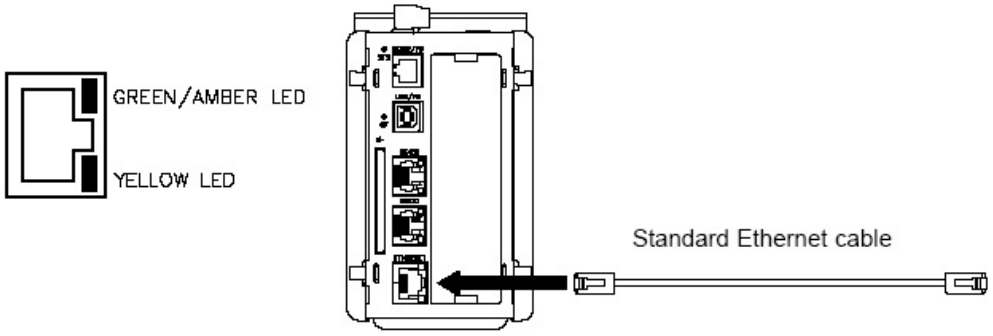


Figure 4.4 Ethernet Connections

ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The Gateway's RJ45 jack (Figure 4.4) is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable. **Default IP Address is 192.168.1.10**

Section 5: Troubleshooting LED's

STS – STATUS LED

The green Status LED provides information regarding the state of the Gateway. This includes indication of the various stages of the start-up routine (power-up), and any errors that may occur.

Startup Routine

LED	Indication
Rapidly Flashing	Gateway is currently loading program
Steady	Gateway is operating normally

Table 5.1 STS LED

SERIAL HOST PORTS - TX/RX LED'S

LED	Indication
Green	Transmitting
Red	Receiving

Table 5.2 Serial Host Port LED's

CDL PORT - TX/RX LED'S

LED	Indication
Green	Transmitting
Red	Receiving

Table 5.3 CDL Port LED's

TCP/IP ETHERNET PORT LED'S

LED	Indication
Yellow (Solid)	Link Established
Yellow (Flashing)	Network Activity
Green	10 BASE-T Communications
Amber	100 BASE-T Communications

Table 5.4 Ethernet Port LED's

These LED's are the first step in troubleshooting communications issues. Please note the action of these LED's, IN DETAIL, when contacting the factory for technical support.

Section 6: MonicoView Programmer

The MonicoView Programmer is a critical part of the product. This free software is used to develop programs or modify files supplied from the factory to meet your needs. Please check on our website for the latest version at www.monicoinc.com. MonicoView is used to adjust port settings for each available port, to disable unused ports to maximize performance, to delete unused or unavailable parameters from polling blocks, and to view live data for all data blocks. MonicoView can also be used to modify any section of the unit programming. ***However, make sure to use LINK-EXTRACT to save a copy of the original .mvd program before making changes. If you click on the UPDATE button before OPENING a valid file or EXTRACTING the existing file, it will result in a blank file being downloaded to the Gateway which will render it ineffective.*** If this should occur, contact the factory and we can email a copy of the file supplied with the Gateway. Please make note of the Version Number on the label on the right side of the Gateway, so we can identify the appropriate file.

When upgrading MonicoView Programmers versions, us the REPAIR option.

The connection is established through a standard USB device cable that has the rectangular connector on one end and the square connector with two rounded edges on the other. ***Make sure to click on LINK-OPTIONS and set the connection to USB.***

Installing USB Drivers

In some cases, connecting a laptop to AC can cause electrical grounding issues. In some situations, a grounded AC supply on a laptop can cause intermittent errors with the laptop USB port. Each time you connect, using the MonicoView Software, to a ***new CDL Gateway*** unit, you will see the Windows "Found New Hardware" screen***. Make sure to plug in the USB Cable when the Gateway is powered down.*** Upon power up, it will then ask for both required drivers to be installed at once.

First Installation

The ***first installation*** of the USB drivers from a specific computer will have to be done ***manually***. After this first installation on a given PC, it will know where to look for the appropriate files. When asked to go to Windows Update to find a driver, select "No, not at this time" and click "Next". This will bring up the screen shown in Figure 6.1 below and the "Install Automatically" should be selected by default. ***INSTEAD***, choose ***Install From List or Specific Location,*** click NEXT and use the Browse button to select the following location:

C:\Program Files\Monico\Monicoview\Device

Click Next and follow the instructions below to finish the process. From this point on, you can use the Automatic Install option which is much simpler.

Subsequent Installations

When asked to go to Windows Update to find a driver, select “No, not at this time” and click “Next”. This will bring up the screen shown in Figure 6.1 below and the “Install Automatically” should be selected by default. If your first installation is not successful, you will need to follow the instructions at the end of this section to navigate to Device Manager and perform a manual install.

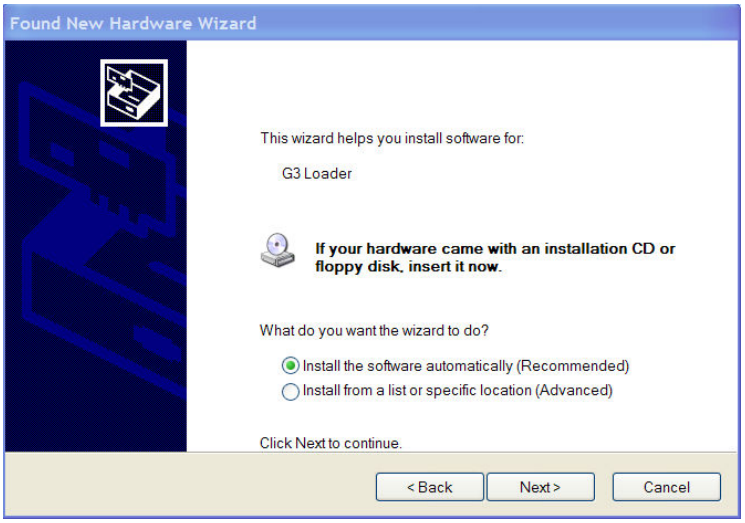

Found New Hardware Wizard
This wizard helps you install software for:
G3 Loader
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Figure 6.1: USB Driver Automatic Installation

After this screen you will see the screen below stating that the driver you are installing has not been tested by Microsoft. Select “Continue Anyway”.

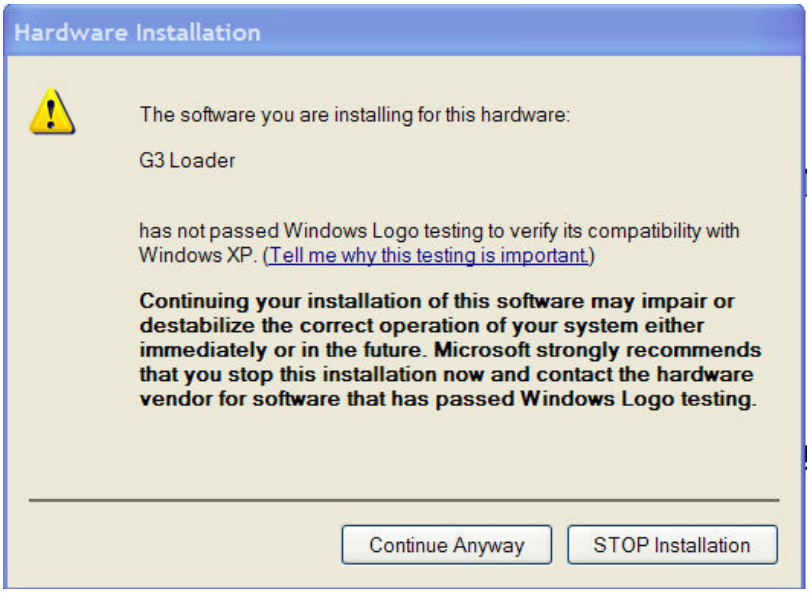

Hardware Installation
The software you are installing for this hardware:
G3 Loader
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Figure 6.2: Windows Compatibility Warning

Click “Finish” when this screen is done. There is another driver that will need to be loaded, but it will not be found until you download the program to the CDL Gateway™. After the initial installation or update of the CDL Gateway™ program, Microsoft will find new hardware again and you will go through the same process again, but instead of calling it “G3 Loader”, it will be called “G3 HMI”.

NOTE: If your Operating System does not successfully install the drivers, you will need to perform this function manually. Go to *Start* and right-click on *My Computer* and choose *Manage*. Then click on *Device Manager* and look for any yellow “!” beside any USB Devices. Right-click on the item and select *Update Driver*. Select Manual Installation this time and when you are asked to specify the ***location of the drivers, you will choose C:\Program Files\Monico\Monicoview\Device*** where the drive letter is the drive you selected when installing the software. This should correct the problem and this issue should not happen again. This only seems to happen the first time Windows attempts to install the first USB driver on a new PC. ***If this problem occurs, it is probably because of laptop USB port issues. Therefore, before following these instructions, disconnect the Gateway from the USB port, disconnect the laptop from AC Power, reboot the PC, and power cycle the Gateway.***

Enabling TCP/IP Download

Any function accomplished through the USB port can also be performed over an Ethernet Network ***with the exception of Firmware Upgrades***. A compact Flash card installed in the Gateway is required to Upgrade Firmware over TCP/IP. However, you must first use the USB connections to enable “IP DOWNLOAD” under the ***REMOTE UPDATE*** section of the Ethernet port. Then you must go to ***LINK-OPTIONS*** and choose TCP/IP and enter the IP address of the CDL Gateway™. From this point you can perform database updates and port setting changes over the LAN.

Deleting Unwanted Parameters

When you expand a Block, you will see what parameters are assigned to each register. You can delete any parameters you will not be using and this will optimize the update rate on the CDL Link. Please keep in mind that the CDL Gateway™ will normally update all the parameters present on an engine in about 2-3 seconds, so for monitoring purposes there is usually no need to optimize. However, if you highlight a register and press the delete button on your keyboard it will remove this parameter. ***Make sure to save an original copy of the program and make changes to the file using another name***. After making these changes, ***you must choose Link>Update to send the changes to the CDL Gateway™***. This is the case with any subsequent changes. Please note that you will not be able to change the register locations using the User

Interface. When you delete the parameter, you are only removing it from the CDL communications.

Adjusting Port Settings

The CDL Gateway™ has several HOST PORTS including two RS-232 ports, an RS-485 port, and an Ethernet port. MonicoView can be used to adjust the settings for any of these ports and to disable the ports that are not being used. For example, if you need to change the port settings for the RS-232 port you would see:

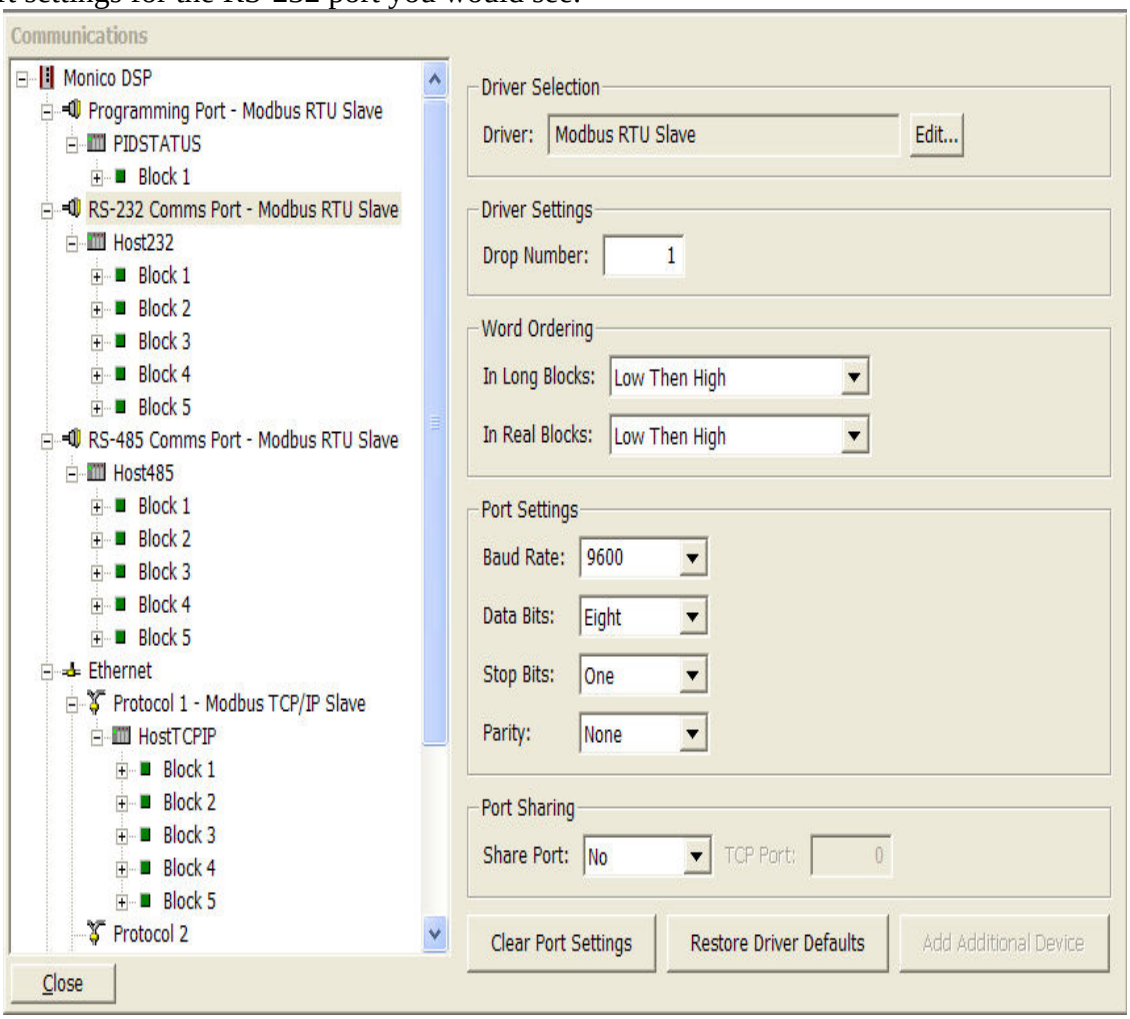


Figure 6.3: Serial Port Communications Settings

To change any of the settings shown in Figure 6.3, highlight the value and enter the new setting and ***press enter to record the change***. If the value is in a drop down window, just select the new settings. Notice that you can set a Drop Number. This allows you to use the RS-232 port with a multi-drop network using RS-232 to RS-485 converters. Enter the Device Address for the CDL Gateway™ (in the case of Slave protocols) in the Drop Number box and press ENTER. If the port is setup as a Master Device, then the target drop number will be entered.

The only difference with the RS-485 port is choosing whether you want 2-wire RS-485 or 4-wire RS-485 or RS-422. This screen is shown in Figure 6.4 below.

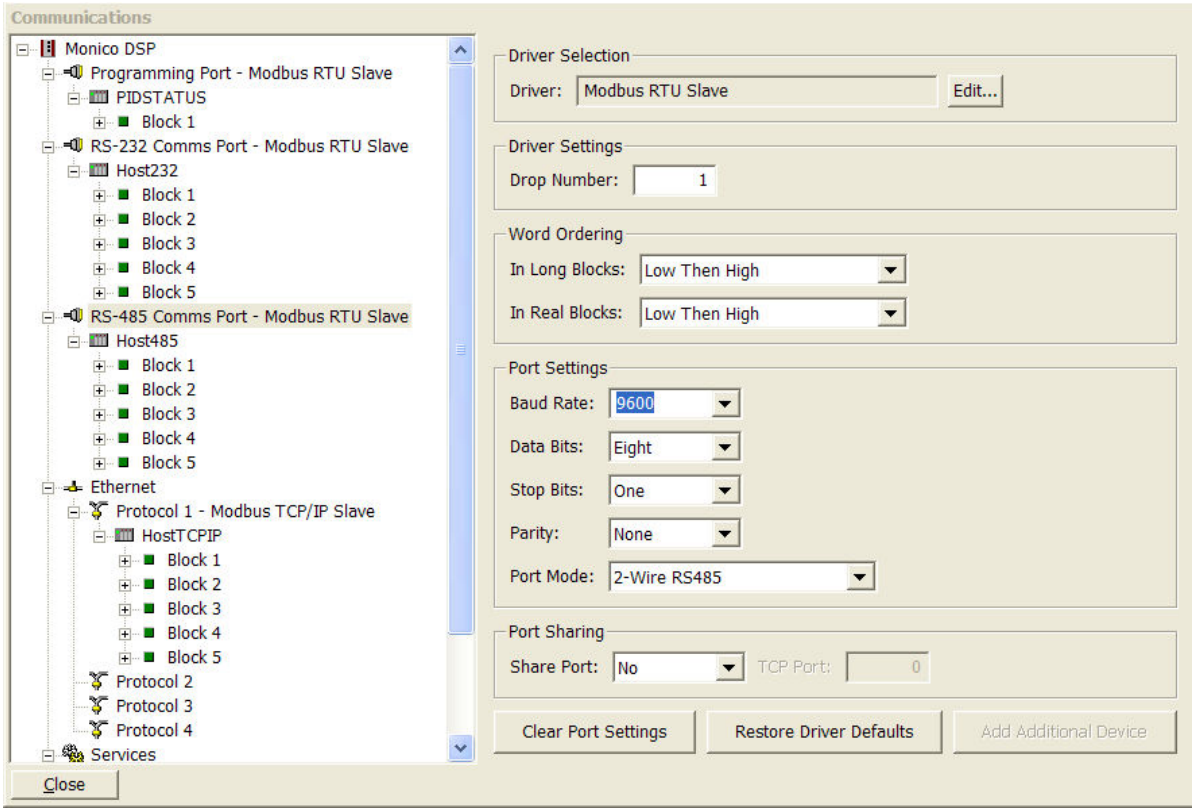


Figure 6.4: RS-485 Serial Port Settings

Settings for the Ethernet port are show in Figure 6.5 and include setting the Port Mode where you set whether to Manually Configure the IP address, request an IP address from a DHCP server or use IEEE 802.3. Then enter the IP address if manually configured and the associated Network Mask and Gateway.

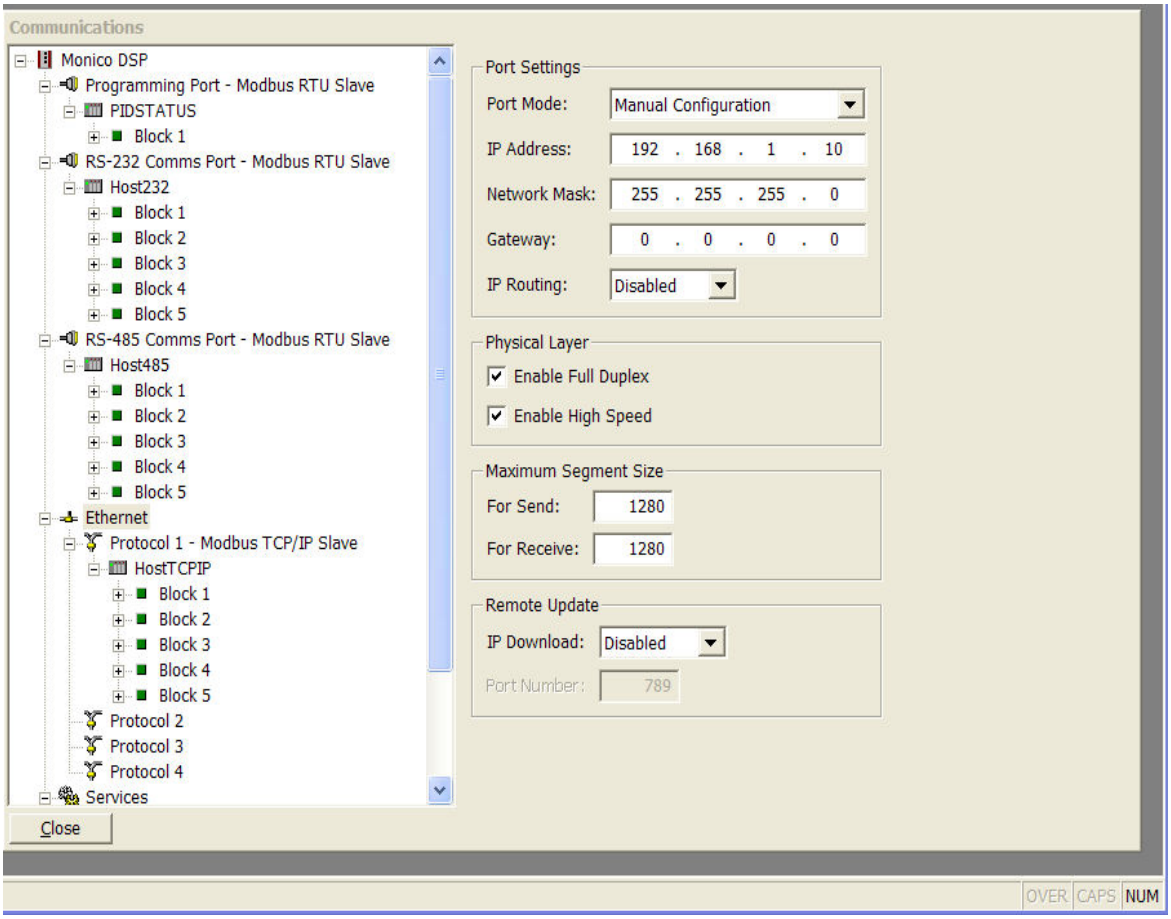


Figure 6.5: TCP/IP Ethernet Port Settings

Disabling and Enabling Ports

The CDL Gateway™ is a standard product that ships pre-configured with all ports active and populated with a full array of values. Since each port will have over 400 registers to update, it is recommended that you disable the unused ports by selecting the port and unchecking the box under Device Settings labeled ENABLE DEVICE as shown in Figure 6.6 below. By disabling unused ports you will maximize the performance of the Gateway.

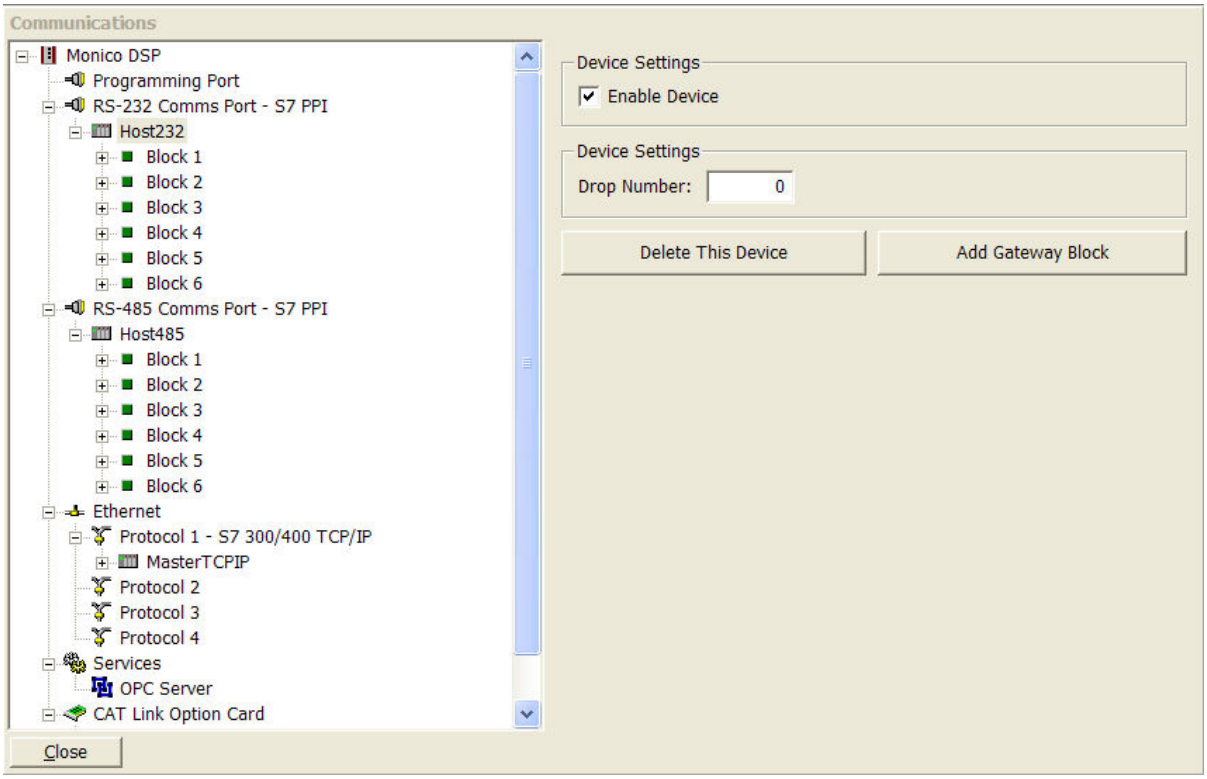


Figure 6.6: Enable/Disable Ports

Viewing Live Data

MonicoView can also be used to view live data for each data block. Highlight an individual data block and click the button labeled View Block. This will cause the software to connect to the CDL Gateway™ and display the current data for each parameter.

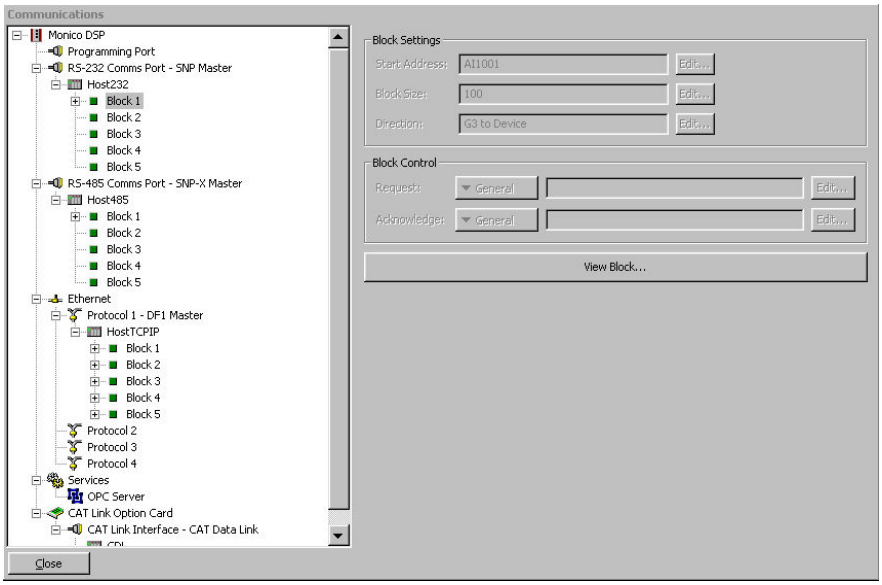


Figure 6.7: View Data Blocks

A table will appear that will show the data block, the parameter tag, and the value in that register in both Decimal and Hexadecimal.

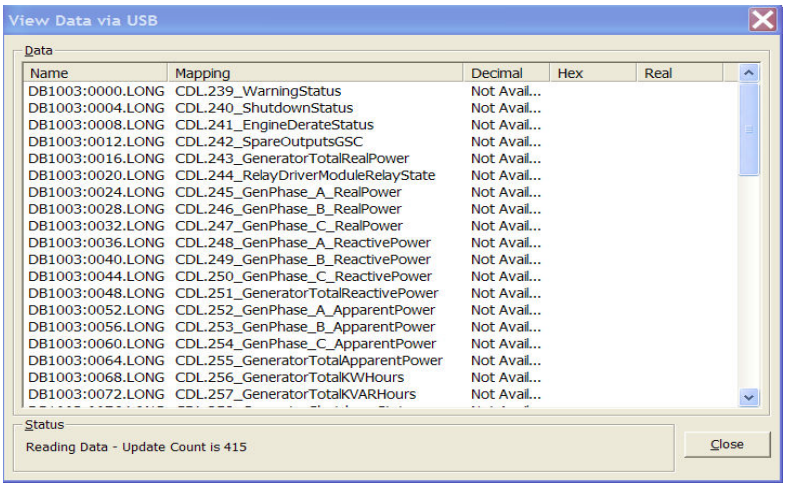


Figure 6.8: Live Block Viewer

Parameter Status Block

A special device named “PIDStatusValues” is usually installed under the Programming RS-232 port. Blocks 1-4 contains registers showing internal details for each possible parameter. These parameters are best viewed in Hex format. The left-hand character (XXxx) indicates the current action in the driver. Consult the factory for details of this parameter if you are experiencing difficulties. The right hand character (xxXX) indicates the controller which is currently providing the parameter. PLEASE NOTE THIS DOES NOT NECESSARILY MEAN YOU WILL HAVE A VALUE IN THE PARAMETER. It simply means that at least one controller on the engine network is responding to the request for that specific parameter. If you have any issues with a particular parameter, it is a good idea to record this status value for use by the factory in troubleshooting. ***Any parameter with a value in the right-hand hex character, should be available in your installation. However, if the appropriate sensor is not actually installed, you may see a high or low range value.***

This feature is critical to know what values are responding in a specific application. If absolute minimum update times are required, you can use MonicoView to delete the unavailable parameters, in the Host Devices, to keep scan times to the absolute minimum.

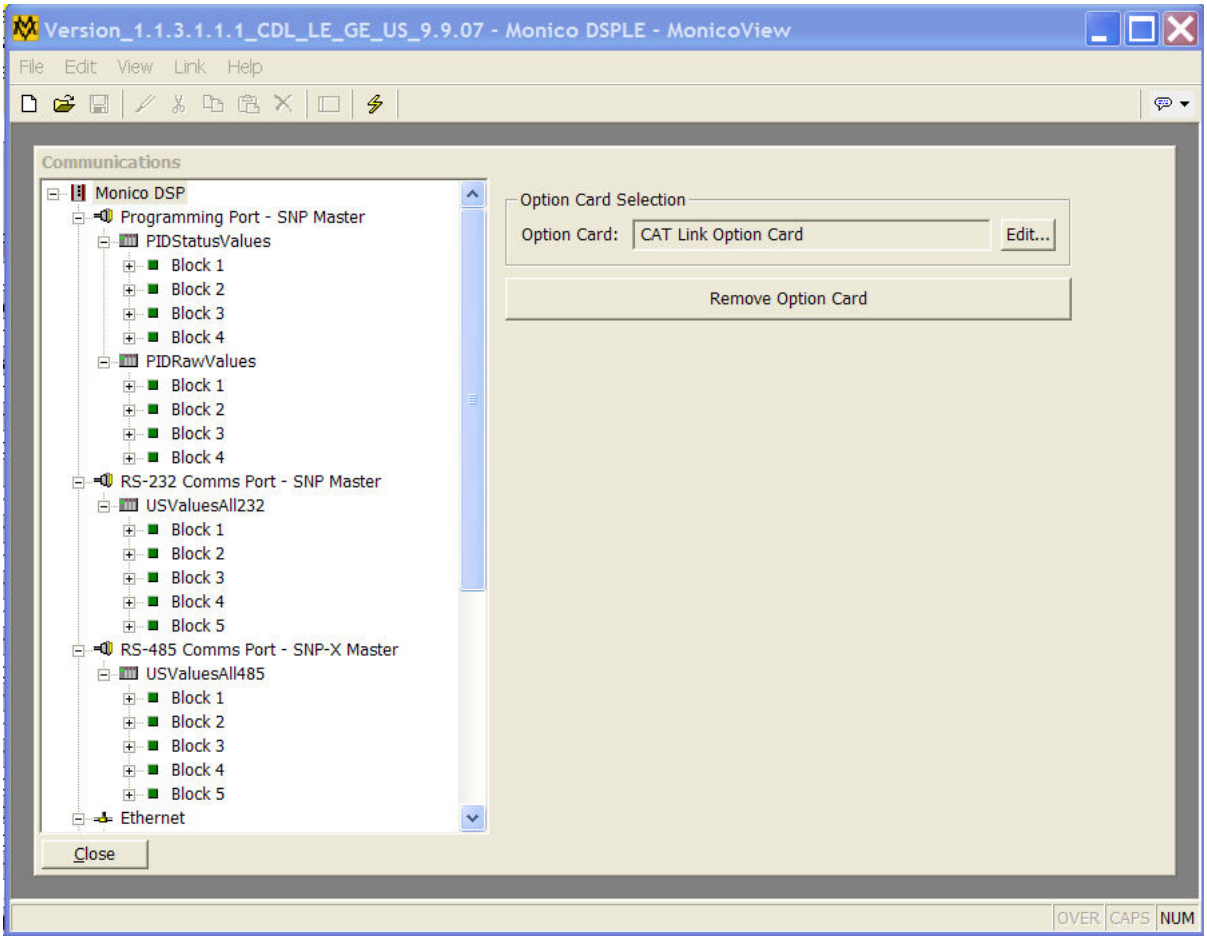


Figure 6.9: Parameter Status Block

Raw Data Block

The second Device installed under the RS-232 Programming Device is called "PIDRawValues". Blocks 1-4 under this Device are setup to view raw values for troubleshooting purposes. These values are the raw values read directly from the CDL Link before any gain is applied or unit conversions are performed. Note that in most of the Modbus Versions, this block is omitted because all values are raw. In the PLC versions, the raw data is useful for troubleshooting conversion formulas and each section of the communications network.

Installing Program Updates

If you are sent a program update from the factory, you will need to install it using MonicoView. First install MonicoView, start the program, connect the CDL Gateway™ via the USB port on the front. If this is the first time you have connected to this particular gateway, you will need to install the USB Drivers as shown above. After the first driver installation is finished, go to the file sent to you by the factory and double-click on it. This

will automatically start MonicoView. Select “Link” and then “Send”. This will begin the download process. During this installation, you will be asked to go through another USB Driver installation as shown above. Then MonicoView will automatically finish loading the upgraded program. **REMEMBER, IF THIS IS THE FIRST USB DRIVER INSTALLATION ON A PARTICULAR COMPUTER, YOU MUST USE THE MANUAL INSTALLATION METHOD OUTLINED ABOVE.**

CDL MONITOR 2.0

In build 444 and above, you will have the option to choose either CDL Monitor 1.0 or CDL Monitor 2.0. CDL 2.0 is much faster than the old driver and automatically identifies more engine module configurations without need for manual intervention. Also, this driver is so fast that the NO RESPONSE DEFERRAL system used in 1.0 was no longer needed. Therefore, data recover after loss of data link communication is only a few seconds using CDL Monitor 2.0 instead of up to 10 minutes using CDL Monitor 1.0.

Data scan rates for all 408 potential parameters using CDL Monitor 2.0 have be measured at .5-3 seconds. This performance is determined by network traffic and engine module configuration, but in all cases the update rate is much improved with the new driver.

CAUTION: If you would like to convert your database to CDL Monitor 2.0, contact the factory before attempting. In some cases, this change will invalidate any mappings associated with the data link. However, the factory technical personnel can quickly modify the database to avoid this problem. Simply email the .mvd file to support@monicoinc.com and request the driver change.

Section 7: Diagnostic and Event Codes

The CDL Gateway™ now supports the Diagnostic and Event codes from the Data Link. To activate support for Diagnostic and Event codes, double-click on the COMMUNICATIONS tab and click on COLLECT FAULT DATA as shown in figure 7.1 below.

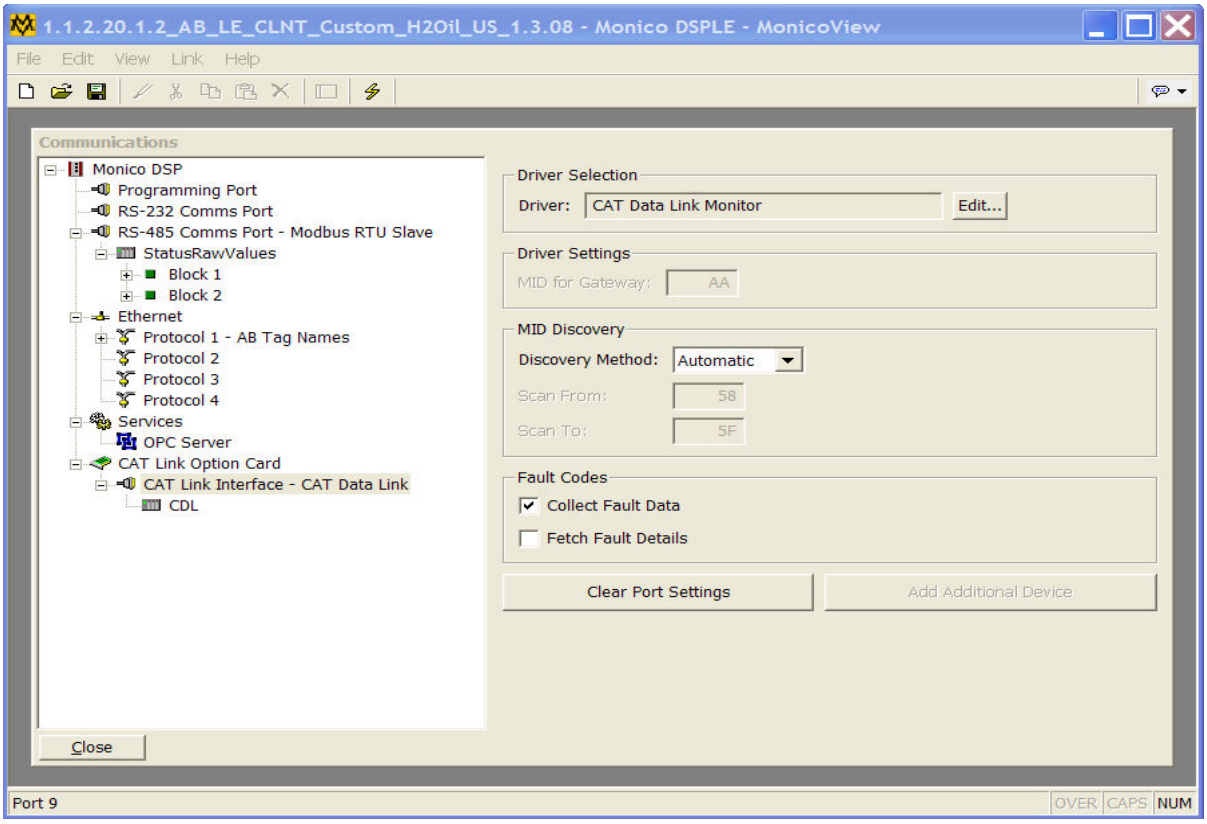


Figure 7.1 Collect Fault Data

If only ***COLLECT FAULT DATA*** is checked, it will cause the following fault data to be collected:

MID-Module Identifier of the diagnosing controller
CID-Component Identifier of the fault device
FMI or SubCode-Fault Mode Identifier showing the severity of the fault
Flags-Indicates whether the codes is Event or Diagnostic Code and whether it is Active or not

If ***FETCH FAULT DETAILS*** is also checked, the driver will also collect the following information for each fault code:

OCCURENCES-Number of times this code has occurred
FIRST-First occurrence in engine operating hours
LAST-Last occurrence in engine operating hours

In figure 7.2 below, you can see a block of fault data collected without Fault Details and mapped to Allen Bradley Tag Names, as an example. As you can see in this figure:

Faultsource=MID
Faultcode=CID
Faultsubcode=FMI or Sub-Code
FaultFlags=Shows whether it is a Diagnostic Code or Event Code (Bit7) and whether the code is currently ACTIVE (Bit0).
If Bit7 of this value is high, then it is a Diagnostic code. If low, then it is an Event.

If Bit 0 of this value is high, then the code is currently ACTIVE. If low, then it is inactive.

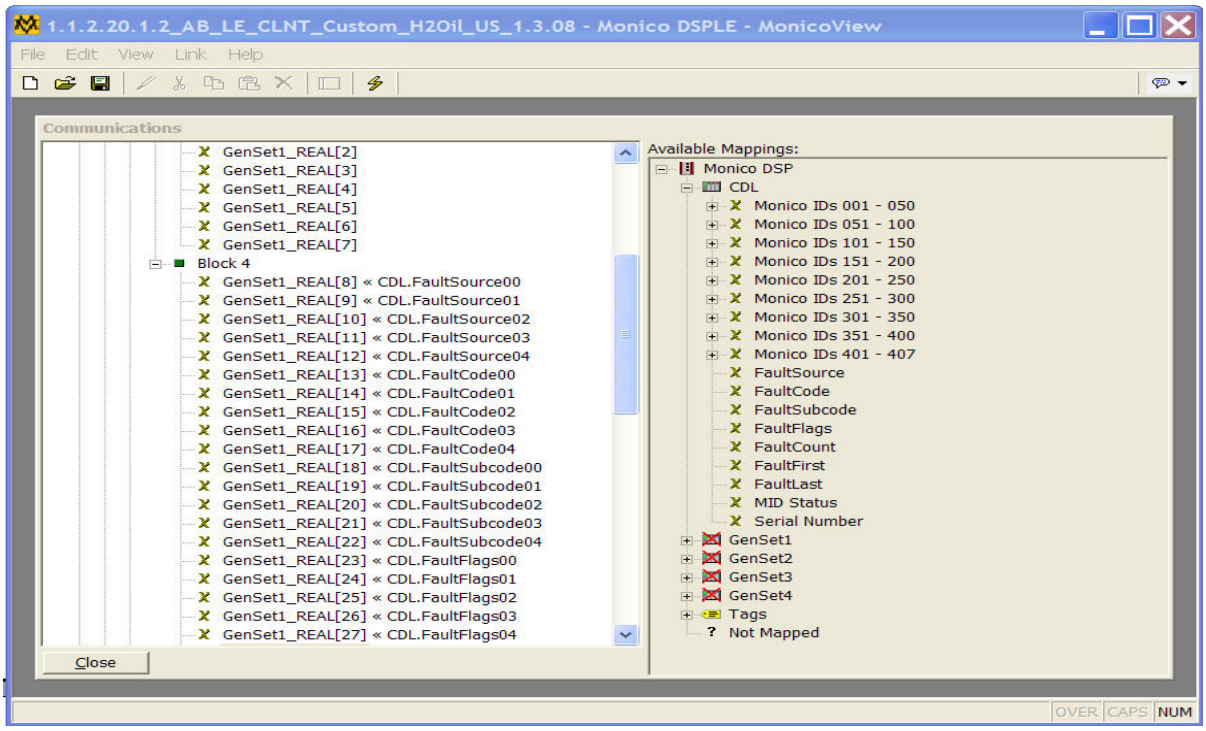


Figure 7.2 FaultCode Data Block

Figure 7.3 below shows a data block example with the Details Fault information where:

FaultCount=Number of Occurrences of this specific Code
FaultFirst=First Occurrence in Engine Operating Hours
FaultLast=Last Occurrence in Engine Operating Hours

The example in Figure 7.3 will result in detailed fault and event codes information for the most recent five fault codes as sorted by Last Occurrence. If more than the last 25 codes are desired, the list is easily expanded.

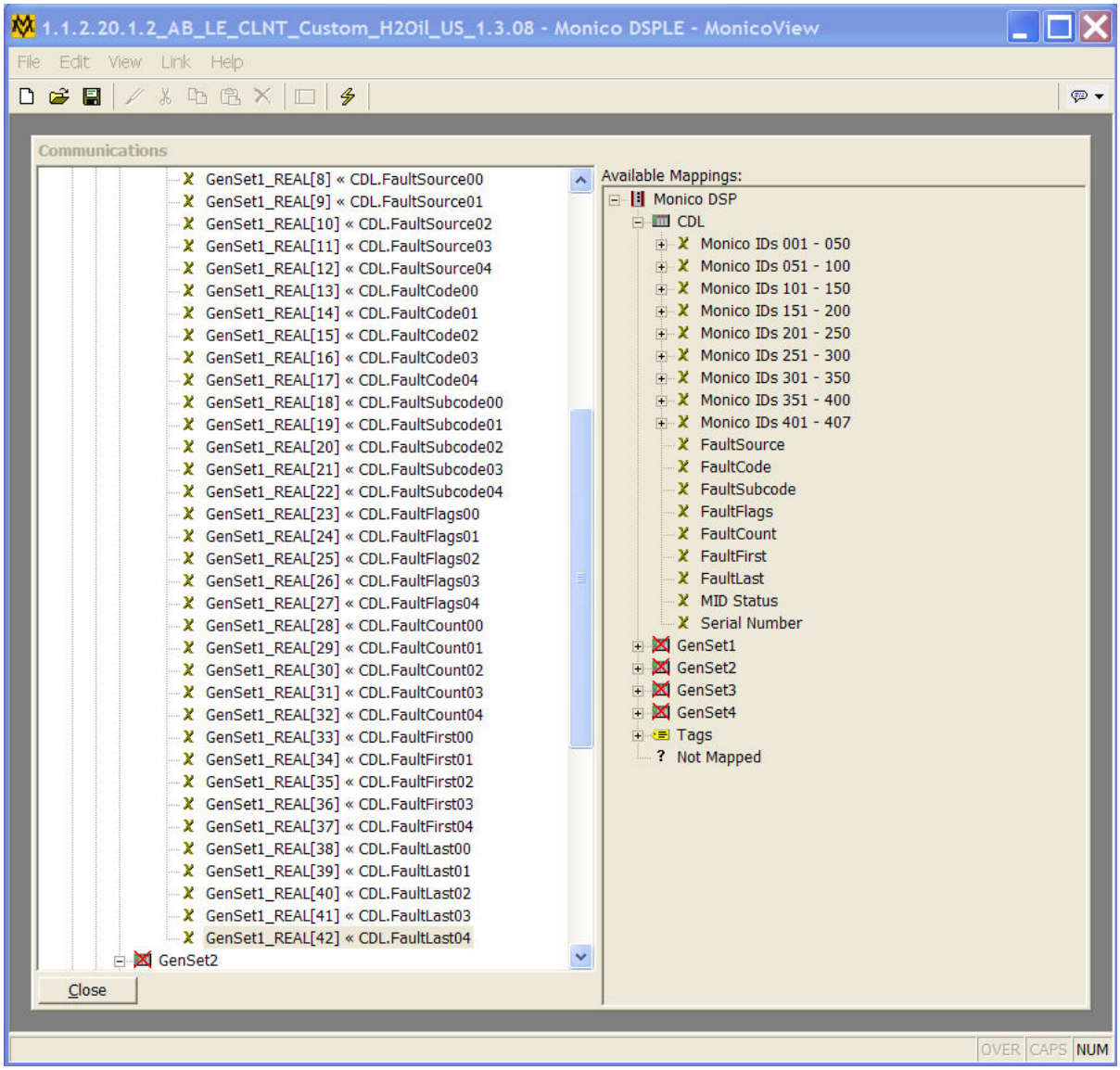


Figure 7.3 Details Fault Code Block Example

Creating Fault Blocks

The pre-configured factory programs do not usually contain fault blocks because it takes up resources and is not required in the majority of applications. Creating custom Fault Blocks is easily accomplished using MonicoView Programmer using the following instructions:

1. After highlighting the desired device, click on ***Add Gateway Block.*** Then highlight the Gateway Block and Click EDIT under the Starting Address section. Choose the appropriate starting address.
2. Then click EDIT under Block Size to choose the total number of registers you want to use for fault codes. So, for five codes using all details you will need 35 registers.
3. Highlight the first register and double-click on FaultSource on the right-hand side of the screen. The resulting screen will be shown in Figure 7.4.
4. Click OK and then it will ask you how many you want to create. This screen is shown in figure 7.5. If you want to capture the last five fault codes, then enter five. If you want the last 25 fault codes, then enter 25.
5. Repeat 1-4 to map registers for each code you wish to capture.

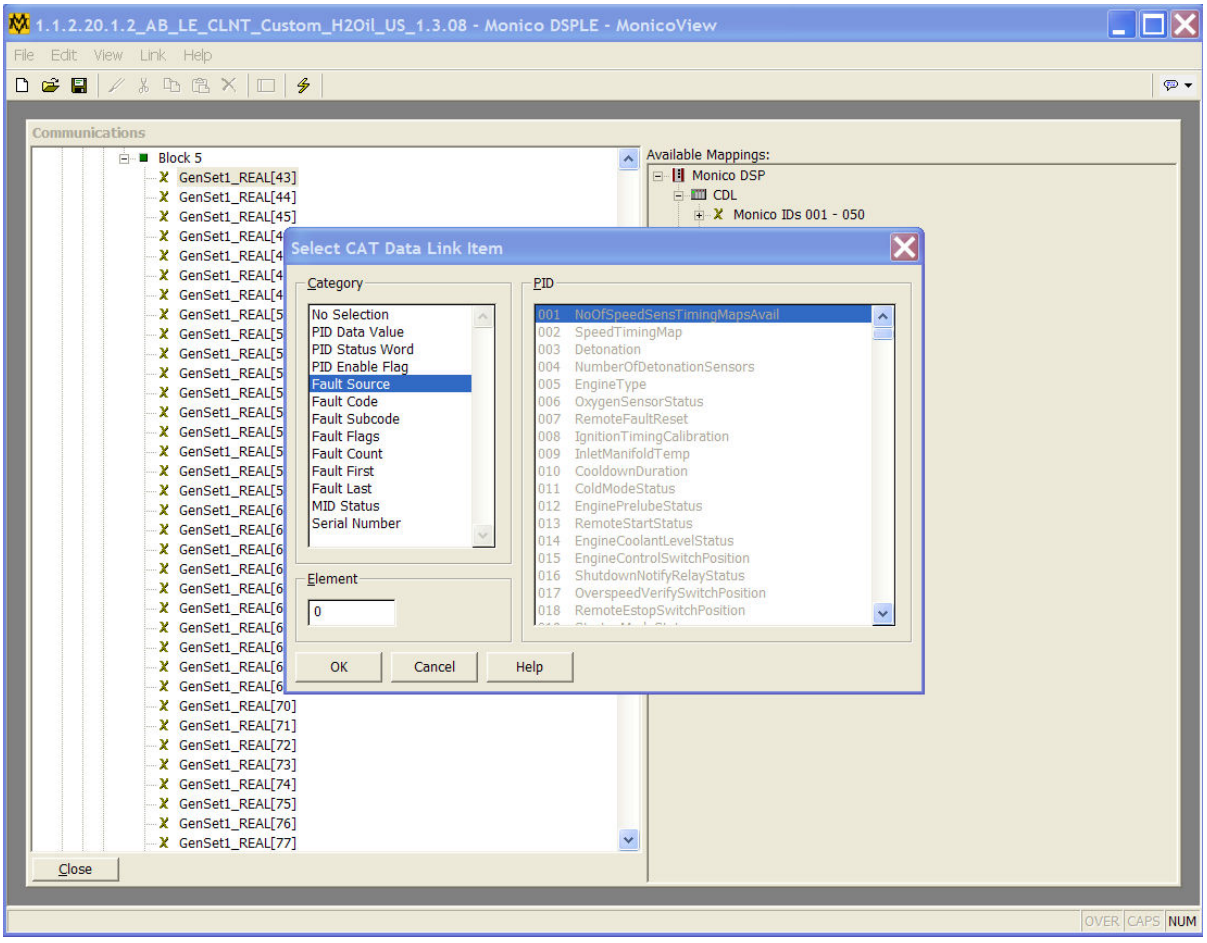


Figure 7.4 Fault Block Creation Example

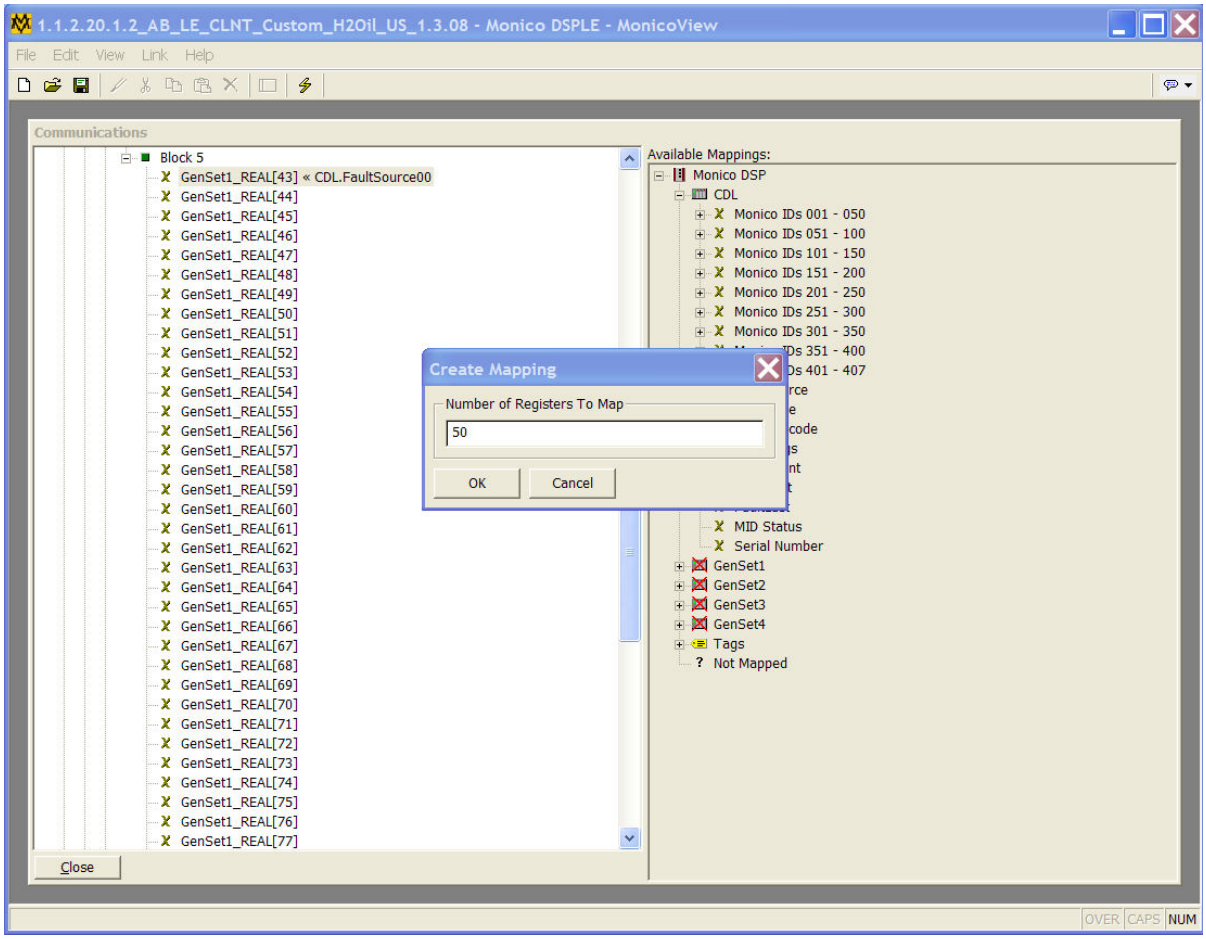


Figure 7.5 Number of Registers to Map Screen

Appendix A: CDL Gateway™-Modbus Version

Modbus Version Overview

The Standard Modbus Version offers three host ports in slave mode. They are:

- Modbus RTU Slave over RS-232 via the RJ-11 jack
- Modbus RTU Slave over RS-485 (2-wire or 4-wire) via RJ-45 jack
- Modbus TCP/IP Slave over Ethernet via RJ-45 jack

Other Modbus versions are available upon request such as a Modbus Master version. One such scenario would be if you had several Modbus RTU Slave devices in the field and want to aggregate them into a single Modbus Data Map. In this case, we can setup the RS-485 to be a Modbus Master to poll the slave devices and map all the registers to the RS-232 or Ethernet port which would be setup as a Modbus Slave. The CDL Gateway™ can also mix Modbus with other protocols such as BACnet and data maps for most of the popular PLC manufacturers. One popular scenario is to use the CDL Gateway™ as a Modbus master to poll several slave devices on RS-485, bring in the engine data, and combine all parameters into a single data map that is compatible with an Allen Bradley, GE Fanuc, or Siemens PLC. Contact the factory to discuss your specific application.

Modbus Address Description

The CDL Gateway™-Modbus Version has a very simple, pre-assigned, address system that starts at 30001 and goes through 30429 for Modbus Function code "4" and 40001-40429 for Modbus Function Code "3". **Currently, it is necessary to specify whether you will be using Function Code "3" or "4". Since this is primarily a monitoring device, our default version uses Input Registers only** The Modbus Data Map is available on the Downloads page of the Monico, Inc. web site (www.monicoinc.com). The data map provides extensive details needed for successful installation and operation of the Gateway. **MAKE SURE YOU HAVE THIS MANUAL AND THE MODBUS DATA MAP WHEN GOING INTO THE FIELD TO INSTALL THE GATEWAY.**

The same groups of addresses are assigned to all of the Host Ports. Therefore, you can poll the same registers from either the RS-485 RJ-45 port, the RS-232 RJ-11 Port, or the Ethernet RJ-45 port. ***IT IS HIGHLY RECOMMENDED TO DISABLE ANY UNUSED PORTS TO OPTIMIZE GATEWAY PERFORMANCE***.

There are other versions of this device that will simulate the same addresses as our Monico CCM Translator, but that version needs to be specifically requested. We also offer versions that utilize other protocols such as BACnet instead of Modbus. Other versions act as remote devices for Allen Bradley Ethernet IP or GE Fanuc PLC's, etc. If you are being forced to convert Modbus into another format or protocol, please give Monico Technical Support a call. We may be able to save you time and money.

Modbus Register Conversion Details

All data is transmitted from the engine network in Metric Units. Therefore, some of the raw values from the modbus registers will require calculations to convert them into actual engine data. Any unit conversion will need to take place after the following instructions. The following information provides a list of the conversion types and the calculations necessary to provide actual engine measurement values.

Hex to Integer
For signed values: Value should be read from the modbus registers as a signed integer. After being read, multiply by the gain and add the offset.
For unsigned values: Value should be read from the modbus registers as an unsigned integer. After being read, multiply by the gain and add the offset.

Engine Type Code as 3 Digit Integer
Format is XYY where X is the engine family and YY is the number of cylinders.

Negative=Active, Positive=Inactive
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Diagnostic Codes

0=False (OFF), NonZero =True (ON) w/Fault Codes
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

0=Stop (OFF), NonZero=Start (ON)
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Multistate
Read from modbus register as unsigned integer. The value is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
15	Engine Control Switch Position	30015	0=Off/reset, 2=Start, 3=Stop, 4=Auto
16	Shutdown Notify Relay Status	30016	0=Relay is OFF, 1=Relay is ON
19	Start-up Mode Status	30019	0=Starter is OFF, 1=Starter is ON, 2=Overcrank, 3=Startup Successful, 224-255 are Fault Identifiers*
27	Engine Prelube Status	30027	Starting at 0: Prelube=OFF, ON, DISABLED, COMPLETED. 4-255 are Fault Identifiers*
30	Remote Throttle Override (Generator Set Only)	30030	0= Normal throttle setting, 1=Low idle setting, 224-255 are Fault Identifiers*
32	Low Idle Switch Position	30032	0=Switch is OFF, 1=Switch is ON, 224-255 are Fault Identifiers*

59	Generator Phase A Power Factor Lead/Lag Status	30059	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
60	Generator Phase B Power Factor Lead/Lag Status	30060	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
61	Generator Phase C Power Factor Lead/Lag Status	30061	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
62	Generator Average Power Factor Lead/Lag Status	30062	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
67	EPG Circuit Breaker Status (GSP+P only)	30067	0=Breaker open, 1=Breaker closed, 228=Breaker sensor input shorted low
151	Engine Coolant Pump Pressure Status	30151	0=coolant pressure OK, 1=coolant pressure too high, 2=Too Low. 0-223 is Valid Range, 224-255 are Fault Identifiers
200	Hydrax Oil Pressure Switch Status	30200	22=Open, 23=Closed. 65504-65535 are Fault Identifiers
202	Emissions Feedback Mode	30202	394=Combustion Time Feedback, 395=Exhaust Temperature Feedback, 397=Calibration Feedback, 398=No Feedback, 65504-65535 are Fault Identifiers

Multistate

Read from modbus register as unsigned integer. The value indicates different status conditions depending on the value being read. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
22	Generator Phase Select	30022	0=Phase A-B Volts A current, 1=Phase B-C Volts B current, 2=Phase C-A Volts C current
25	Generator AC Voltage Full Scale and External PT Setpoint	30025	0=700v, 1=150v, 2=300, 3=500, 4=600, 5=750, 6=3k, 7=4.5k, 8=5.25k, 9=9k, 10=15k, 11=18k, 12=30k
26	Generator AC Current Full Scale Setpoint (Read)	30026	starting at 0: 75,100,150,200,300,400,600,800,1k,1.2k,1.5k,2k,2.5k,3k,4k Amps
31	ECM in Control (Marine Only)	30031	0=Primary ECM is controlling, 1=Backup ECM is controlling
57	Generator AC Voltage Full Scale Transformer Setpoint	30057	0=700v, 1=150v, 2=300, 3=500, 4=600, 5=750, 6=3k, 7=4.5k, 8=5.25k, 9=9k, 10=15k, 11=18k, 12=30k
58	Generator AC Current Full Scale Setpoint	30058	starting at 0: 75,100,150,200,300,400,600,800,1k,1.2k,1.5k,2k,2.5k,3k,4k Amps
68	Remote Generator Synchronizer Control (GSP+P only)	30068	(This can be written to) 0=Off, 1=Remote synchronization test, 2=Automatic synchronization
69	Remote Synchronization Control Readiness (GSP+P only)	30069	0=Not installed, 1=ready for remote command, 2=Synchronizing switch not in auto, 3=Engine control switch not in auto, 4 Engine was not started remotely, 5 Engine not running
70	Generator Synchronizer Control Status (GSP+P only)	30070	Starting at 0: Not installed, Inactive, Semiautomatic paralleling, Permissive paralleling, Remote synchronization testing, Synchronizing, Synchronization system alarm or diag., Remote synchronization testing passed, Dead bus time delay, Closing to dead bus.
201	Normal Stop Input Status	30201	113=Run, 174=Stop

Multiple Status Bits

Read from modbus register as unsigned integer. The value is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
6	Oxygen Sensor Status	30006	Bits set to 1 indicate Status: 8=start cal. 7= cal in progress, 6=sensor on, 5= command sensor on
8	Ignition Timing Calibration	30008	Bits set to 1 indicate Status: 8=cal good else cal bad, 7= enable cal else disable cal
40	G3600 Engine Status	30040	Bit8: 0=idle, 1=rated. Bit7: 0=off grid, 1=on grid. Bit6-5: 00=running, 01=coasting, 10=shutdown, 11=not used
41	Engine Operation	30041	Bit8: 0=genset, 1=industrial. Bit6: 0=isochronous govenor, 1=droop govenor
46	Auxiliary Status	30046	Mode Control Switch Bit8-7: 11=start, 10=auto, 01=stop, 00=off/reset. E-Stop Bit6: 1=stop, 0=run. Driven Equipment Bit5: 1=Ready, 0=Not Ready. Prelube Slave Relay Bit4: 1=ON, 2=OFF. Prelube Relay Bit3: 1=ON, 2=OFF. Prelube Switch Bit2: 1=Not Ready, 0=Ready. Initiate Contact Bit1: 1=Stop, 0=Run.
52	EIS Special Test Status	30052	Inactive (Tests should only be done on-site) bit 8: 1=Enable special test, 0=disable. Bit7: 0=proceed to test B. Bit5-1 0=test passed. Non zero=# of tests failed
56	Diagnostic Status Summary	30056	Bits 2-1: 0=None, 1=Level 1 Warning, 2=Level2 Warning, 3=Level 3 Warning. Bit 3&4 not used. Bit 5: 0=No logged events, 1=At least 1 logged event. Bit 6 not used. Bit7: 0=No logged diag., 1=At least 1 logged diag. Bit8: 0=No active diag. 1=At least 1 active diag.
65	General Alarm Output Status/Override (Marine Only)	30065	(This can be written to) Bit 8: 1=Override, 0=Normal. Bit 1: 0=Output is OFF, 1=Output is ON
77	Engine Status	30077	Bit 4: 1=Fuel injection disabled, 0=No injection disabled. Bit5: 1=E-stop shutdown, 0=No E-stop shutdown. Bit 1: 1=No Engine Speed, 0=Engine Speed
90	GSC Relay Status	30090	Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 3=Relay not installed: Bits 2, 1=Air Shutoff Relay. Bits 4,3=Fuel Control Relay. Bits 6,5=Crank Terminate Relay. Bits 8,7=Starter Motor Relay. Bits 10,9=Genset Fault Relay. Bits 12,11=Run Relay. Bits 14,13=Program Spare Relay. Bits 16,15=Electronic Govenor Relay.
91	GSC Relay Control	30091	(only bits 16-13 are write able) Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 3=Relay not installed, keep same state: Bits 2,1=Air Shutoff Relay. Bits 4,3=Fuel Control Relay. Bits 6,5=Crank Terminate Relay. Bits 8,7=Starter Motor Relay. Bits 10,9=Genset Fault Relay. Bits 12,11=Run Relay. Bits 14,13=Program Spare Relay. Bits 16,15=Electronic Govenor Relay.
93	GSC Alarm Status	30093	Organized by bit pairs where for each pair 0=Alarm Off, 1=Alarm On, 3=Not Available: Bits 2,1=High Coolant Temp. Bits 4,3=Low Coolant Temp. Bits 6,5=Low Oil Psi. Bits 8,7=Eng Control Switch not in Auto or Manual. Bits 10,9=High Oil Temp. Bits 12,11=Eng Control Alarm. Bits 14,13=Not used. Bits 16,15=Undefined.

Monico Id	PID Description	Modbus Address	Manual Remarks
94	GSC Shutdown Status	30094	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 2,1=Diag Code. Bits 4,3=Coolant Loss. Bits 6,5=Emg Stop. Bits 8,7=Spare Fault. Bits 10,9=High Coolant Temp. Bits 12,11=Low Oil Psi. Bits 14,13=Overcrank. Bits 16,15=Overspeed.
95	GSC Spare Fault Alarm Status	30095	Organized by bit pairs where for each pair 0=Alarm Off, 1=Alarm On, 3=Not Available: Bits 2,1=Spare Fault 1. Bits 4,3=Spare Fault 2. Bits 6,5=Spare Fault 3. Bits 8,7=Spare Fault 4. 16-9=Undefined.
96	GSC Spare Fault Shutdown Status	30096	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 2,1=Spare Fault 1. Bits 4,3=Spare Fault 2. Bits 6,5=Spare Fault 3. Bits 8,7=Spare Fault 4. 16-9=Undefined.
146	Generator Set Control Output Status (GSC+ only)	30149	Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 2=Output Fault, 3=Output not installed: Bits 2,1=Close Breaker Output. Bits 4,3=Kilowatt Relay Control Output
112	Generator Set Shutdown Status - Extension #1	30112	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 13,14=Engine Control Shutdown. Bits 15,16=High Engine Oil Temp.
150	Active Warning Summary Status	30150	Bit 16=Warning Level 1, Bit 15=Warning Level 2, Bit 14=Warning Level 3 (bit value: 0=INACTIVE, 1=ACTIVE)

0=Enabled, NonZero=Disabled
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

0=Inactive, NonZero=Active
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Hex to Long Integer
The value is contained in 2 consecutive modbus registers. For example, if the first value is at address 40001 the value at 40002 will also need to be read.

Read each register as an unsigned integer. Take the first value and multiply by 65536. Then add the second value. Multiply the result by the gain and add the offset.

Long Multiple Status Bits
The value is contained in 2 consecutive modbus registers. For example, if the first value is at address 30001 the value at 30002 will also need to be read.

Read each register as an unsigned integer. Take the first value and multiply by 65536. Then add the second value.

The result is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
239	Warning Status	30239	Each of the first 24 bits represents warning status. 0 = Warning is NOT ACTIVE 1 = Warning is ACTIVE bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
240	Shutdown Status	30240	Each of the first 24 bits represents Shutdown status. 0 = Engine Shutdown is NOT ACTIVE 1 = Engine Shutdown is ACTIVE bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
241	Engine Derate Status	30241	Each of the first 24 bits represents Eng. Derate status. 0 = Engine Derate is NOT ACTIVE 1 = Engine Derate is ACTIVE bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed

Monico Id	PID Description	Modbus Address	Manual Remarks
			bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
242	Spare Outputs (GSC+ only)	30242	(writable) Bits 26-25 Spare Output, All other bit pairs are undefined. 0=OFF, 1=ON, 16=Output Fault, 17=Output not available
244	Relay Driver Module Relay State	30244	(writable) For each group of bits: 00 = OFF/DE-ENERGIZED; 01 = ON/ENERGIZED; 10 = Output fault; 11 = Output not available/ Don't change state. bits 1-2 = Undefined, future use bits 3-4 = Undefined, future use bits 5-6 = Undefined, future use bits 7-8 = Undefined, future use bits 9-10 = Output 9 bits 11-12 = Undefined, future use bits 13-14 = Undefined, future use bits 15-16 = Undefined, future use bits 17-18 = Output 5 bits 19-20 = Output 6 bits 21-22 = Output 7 bits 23-24 = Output 8 bits 25-26 = Output 1 bits 27-28 = Output 2 bits 29-30 = Output 3 bits 31-32 = Output 4
258	Generator Shutdown Status (GSC+ only)	30258	For each group of bits: 00 = Shutdown inactive; 01 = Shutdown active; 10 = Undefined; 11 = Not available, or not installed. bits 1-2 = Underfrequency bits 3-4 = Overfrequency bits 5-6 = Undervoltage bits 7-8 = Overvoltage bits 9-10 = Generator Frequency Sensing Fault bits 11-12 = Generator Total Overcurrent bits 13-14 = Single Phase Overcurrent bits 15-16 = Reverse Power bits 17-18 = Undefined, future use bits 19-20 = Undefined, future use bits 21-22 = Undefined, future use bits 23-24 = Generator Freq. Inconsistent w/Eng Speed bits 25-26 = Undefined, future use bits 27-28 = Undefined, future use bits 29-30 = Undefined, future use bits 31-32 = Undefined, future use
259	Generator Alarm Status (GSC+ only)	30259	For each group of bits: 00 = Alarm inactive; 01 = Alarm

Monico Id	PID Description	Modbus Address	Manual Remarks
			active; 10 = Undefined; 11 = Not available, or not installed. bits 1-2 = Underfrequency bits 3-4 = Overfrequency bits 5-6 = Undervoltage bits 7-8 = Overvoltage bits 9-10 = Generator Frequency Sensing Fault bits 11-12 = Generator Total Overcurrent bits 13-14 = Single Phase Overcurrent bits 15-16 = Reverse Power bits 17-18 = Undefined, future use bits 19-20 = Undefined, future use bits 21-22 = Undefined, future use bits 23-24 = Generator Freq. Inconsistent w/Eng Speed bits 25-26 = Undefined, future use bits 27-28 = Undefined, future use bits 29-30 = Undefined, future use bits 31-32 = Undefined, future use
260	High Exhaust Port Temp Deviating Low Warning	30260	Status indicated by bits. 0-4294967295 is Valid Range. Each of the first 24 bits represents warning status. 0 = Warning is NOT ACTIVE 1 = Warning is ACTIVE bit 1 = Exhaust Temperature Deviating Low bit 2 = Exhaust Temperature Deviating High
261	High Exhaust Port Temp Deviating Low Shutdown	30261	Status indicated by bits. 0 = Shutdown is NOT ACTIVE 1 = Shutdown is ACTIVE bit 1 = Exhaust Temperature Deviating Low bit 2 = Exhaust Temperature Deviating High

Appendix B: CDL Gateway™-CCM Translator Modbus Version

Modbus Address Description

The CDL Gateway™-Modbus Version has a very simple, pre-assigned, address system that starts at 30001 and goes through 30429 for Modbus Function code "4" and 40001-40429 for Modbus Function Code "3". **Currently, it is necessary to specify whether you will be using Function Code "3" or "4".** The Modbus Data Map is available on the Downloads page of the Monico, Inc. web site (www.monicoinc.com). The data map provides extensive details needed for successful installation and operation of the Gateway. **MAKE SURE YOU HAVE THIS MANUAL AND THE MODBUS DATA MAP WHEN GOING INTO THE FIELD TO INSTALL THE GATEWAY.**

The same groups of addresses are assigned to all of the Host Ports. Therefore, you can poll the same registers from either the RS-485 RJ-45 port, the RS-232 RJ-11 Port, or the Ethernet RJ-45 port.

The purpose of these versions is to simulate the same addresses as our Monico CCM Translator, but these versions need to be specifically requested. We also offer versions that utilize other protocols such as BACnet instead of Modbus. Other versions act as remote devices for Allen Bradley Ethernet IP or GE Fanuc PLC's, etc. If you are being forced to convert Modbus into another format or protocol, please give Monico Technical Support a call. We may be able to save you time and money.

Modbus Register Conversion Details

All values are transmitted in Metric Units. Therefore, some of the raw values from the Modbus registers will require calculations to convert them into actual engine data. Any unit conversion will need to take place after the following instructions. The following information provides a list of the conversion types and the calculations necessary to provide actual engine measurement values.

Hex to Integer
For signed values: Value should be read from the Modbus registers as a signed integer. After being read, multiply by the gain and add the offset.
For unsigned values: Value should be read from the Modbus registers as an unsigned integer. After being read, multiply by the gain and add the offset.

Engine Type Code as 3 Digit Integers
Format is XYY where X is the engine family and YY is the number of cylinders.

Negative=Active, Positive=Inactive
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Diagnostic Codes
Will be supported in the near future

0=False (OFF), NonZero =True (ON) w/Fault Codes
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

0=Stop (OFF), NonZero=Start (ON)
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Multistate
Read from Modbus register as unsigned integer. The value is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
17	Engine Control Switch Position	30019	0=Off/reset, 2=Start, 3=Stop, 4=Auto
18	Shutdown Notify Relay Status	30020	0=Relay is OFF, 1=Relay is ON
21	Start-up Mode Status	30023	0=Starter is OFF, 1=Starter is ON, 2=Overcrank, 3=Startup Successful, 224-255 are Fault Identifiers*
29	Engine Prelube Status	30031	Starting at 0: Prelube=OFF, ON, DISABLED, COMPLETED. 4-255 are Fault Identifiers*
32	Remote Throttle Override (Generator Set Only)	30034	0= Normal throttle setting, 1=Low idle setting, 224-255 are Fault Identifiers*
34	Low Idle Switch Position	30036	0=Switch is OFF, 1=Switch is ON, 224-255 are Fault Identifiers*
63	Generator Phase A Power Factor Lead/Lag Status	30065	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
64	Generator Phase B Power Factor Lead/Lag Status	30066	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
65	Generator Phase C Power Factor Lead/Lag Status	30067	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
66	Generator Average Power Factor Lead/Lag Status	30068	0=Current lags voltage, 1=Current leads voltage, 224-255 Fault Identifiers*
71	EPG Circuit Breaker Status (GSP+P only)	30073	0=Breaker open, 1=Breaker closed, 228=Breaker sensor input shorted low
257	Engine Coolant Pump Pressure Status	30290	0=coolant pressure OK, 1=coolant pressure too high, 2=Too Low. 0-223 is Valid Range, 224-255 are Fault Identifiers
329	Hydrax Oil Pressure Switch Status	30362	22=Open, 23=Closed. 65504-65535 are Fault Identifiers
331	Emissions Feedback Mode	30364	394=Combustion Time Feedback, 395=Exhaust Temperature Feedback, 397=Calibration Feedback, 398=No Feedback, 65504-65535 are Fault Identifiers

Multistate
Read from Modbus register as unsigned integer. The value indicates different status conditions depending on the Caterpillar value being read. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks

Monico Id	PID Description	Modbus Address	Manual Remarks
24	Generator Phase Select	30026	0=Phase A-B Volts A current, 1=Phase B-C Volts B current, 2=Phase C-A Volts C current
27	Generator AC Voltage Full Scale and External PT Setpoint	30029	0=700v, 1=150v, 2=300, 3=500, 4=600, 5=750, 6=3k, 7=4.5k, 8=5.25k, 9=9k, 10=15k, 11=18k, 12=30k
28	Generator AC Current Full Scale Setpoint (Read)	30030	starting at 0: 75,100,150,200,300,400,600,800,1k,1.2k,1.5k,2k,2.5k,3k,4k Amps
33	ECM in Control (Marine Only)	30035	0=Primary ECM is controlling, 1=Backup ECM is controlling
61	Generator AC Voltage Full Scale Transformer Setpoint	30063	0=700v, 1=150v, 2=300, 3=500, 4=600, 5=750, 6=3k, 7=4.5k, 8=5.25k, 9=9k, 10=15k, 11=18k, 12=30k
62	Generator AC Current Full Scale Setpoint	30064	starting at 0: 75,100,150,200,300,400,600,800,1k,1.2k,1.5k,2k,2.5k,3k,4k Amps
72	Remote Generator Synchronizer Control (GSP+P only)	30074	(This can be written to) 0=Off, 1=Remote synchronization test, 2=Automatic synchronization
73	Remote Synchronization Control Readiness (GSP+P only)	30076	0=Not installed, 1=ready for remote command, 2=Synchronizing switch not in auto, 3=Engine control switch not in auto, 4 Engine was not started remotely, 5 Engine not running
74	Generator Synchronizer Control Status (GSP+P only)	30077	Starting at 0: Not installed, Inactive, Semiautomatic paralleling, Permissive paralleling, Remote synchronization testing, Synchronizing, Synchronization system alarm or diag., Remote synchronization testing passed, Dead bus time delay, Closing to dead bus.
330	Normal Stop Input Status	30363	113=Run, 174=Stop

Multiple Status Bits

Read from Modbus register as unsigned integer. The value is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
6	Oxygen Sensor Status	30006	Bits set to 1 indicate Status: 8=start cal. 7= cal in progress, 6=sensor on, 5= command sensor on
8	Ignition Timing Calibration	30008	Bits set to 1 indicate Status: 8=cal good else cal bad, 7= enable cal else disable cal
42	G3600 Engine Status	30044	Bit8: 0=idle, 1=rated. Bit7: 0=off grid, 1=on grid. Bit6-5: 00=running, 01=coasting, 10=shutdown, 11=not used
43	Engine Operation	30045	Bit8: 0=genset, 1=industrial. Bit6: 0=isochronous governor, 1=droop governor
48	Auxiliary Status	30050	Mode Control Switch Bit8-7: 11=start, 10=auto, 01=stop, 00=off/reset. E-Stop Bit 6: 1=stop, 0=run. Driven Equipment Bit5: 1=Ready, 0=Not Ready. Prelube Slave Relay Bit 4: 1=ON, 2=OFF. Prelube Relay Bit3: 1=ON, 2=OFF. Prelube Switch Bit2: 1=Not Ready, 0=Ready. Initiate Contact Bit1: 1=Stop, 0=Run.
55	EIS Special Test Status	30057	Inactive (Tests should only be done on-site) bit 8: 1=Enable special test, 0=disable. Bit7: 0=proceed to test B. Bit5-1 0=test passed. Non zero=# of tests failed

Monico Id	PID Description	Modbus Address	Manual Remarks
60	Diagnostic Status Summary	30062	Bits 2-1: 0=None, 1=Level 1 Warning, 2=Level2 Warning, 3=Level 3 Warning. Bit 3&4 not used. Bit 5: 0=No logged events, 1=At least 1 logged event. Bit 6 not used. Bit7: 0=No logged diag., 1=At least 1 logged diag. Bit8: 0=No active diag. 1=At least 1 active diag.
69	General Alarm Output Status/Override (Marine Only)	30071	(This can be written to) Bit 8: 1=Override, 0=Normal. Bit 1: 0=Output is OFF, 1=Output is ON
99	Engine Status	30102	Bit 4: 1=Fuel injection disabled, 0=No injection disabled. Bit5: 1=E-stop shutdown, 0=No E-stop shutdown. Bit 1: 1=No Engine Speed, 0=Engine Speed
116	GSC Relay Status	30119	Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 3=Relay not installed: Bits 2,1=Air Shutoff Relay. Bits 4,3=Fuel Control Relay. Bits 6,5=Crank Terminate Relay. Bits 8,7=Starter Motor Relay. Bits 10,9=Genset Fault Relay. Bits 12,11=Run Relay. Bits 14,13=Program Spare Relay. Bits 16,15=Electronic Governor Relay.
117	GSC Relay Control	30120	(only bits 16-13 are write able) Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 3=Relay not installed, keep same state: Bits 2,1=Air Shutoff Relay. Bits 4,3=Fuel Control Relay. Bits 6,5=Crank Terminate Relay. Bits 8,7=Starter Motor Relay. Bits 10,9=Genset Fault Relay. Bits 12,11=Run Relay. Bits 14,13=Program Spare Relay. Bits 16,15=Electronic Governor Relay.
121	GSC Alarm Status	30124	Organized by bit pairs where for each pair 0=Alarm Off, 1=Alarm On, 3=Not Available: Bits 2,1=High Coolant Temp. Bits 4,3=Low Coolant Temp. Bits 6,5=Low Oil Psi. Bits 8,7=Eng Control Switch not in Auto or Manual. Bits 10,9=High Oil Temp. Bits 12,11=Eng Control Alarm. Bits 14,13=Not used. Bits 16,15=Undefined.
122	GSC Shutdown Status	30125	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 2,1=Diag Code. Bits 4,3=Coolant Loss. Bits 6,5=Emg Stop. Bits 8,7=Spare Fault. Bits 10,9=High Coolant Temp. Bits 12,11=Low Oil Psi. Bits 14,13=Overcrank. Bits 16,15=Overspeed.
123	GSC Spare Fault Alarm Status	30126	Organized by bit pairs where for each pair 0=Alarm Off, 1=Alarm On, 3=Not Available: Bits 2,1=Spare Fault 1. Bits 4,3=Spare Fault 2. Bits 6,5=Spare Fault 3. Bits 8,7=Spare Fault 4. 16-9=Undefined.
124	GSC Spare Fault Shutdown Status	30127	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 2,1=Spare Fault 1. Bits 4,3=Spare Fault 2. Bits 6,5=Spare Fault 3. Bits 8,7=Spare Fault 4. 16-9=Undefined.
146	Generator Set Control Output Status (GSC+ only)	30149	Organized by bit pairs where for each pair 0=Off/de-energized, 1=On/energized, 2=Output Fault, 3=Output not installed: Bits 2,1=Close Breaker Output. Bits 4,3=Kilowatt Relay Control Output
147	Generator Set Shutdown Status - Extension #1	30150	Organized by bit pairs where for each pair 0=Shutdown Inactive, 1=Shutdown Active, 3=Not Available: Bits 13,14=Engine Control Shutdown. Bits 15,16=High Engine Oil Temp.
254	Active Warning Summary Status	30285	Bit 16=Warning Level 1, Bit 15=Warning Level 2, Bit 14=Warning Level 3 (bit value: 0=INACTIVE, 1=ACTIVE)

0=Enabled, NonZero=Disabled
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

0=Inactive, NonZero=Active
A value of 0 indicates that the status is inactive, disabled or off.
A value of 1 indicates that the status is active, enabled or on.

Hex to Long Integer
The value is contained in 2 consecutive Modbus registers. For example, if the first value is at address 40001 the value at 40002 will also need to be read.

Read each register as an unsigned integer. Take the first value and multiply by 65536. Then add the second value. Multiply the result by the gain and add the offset.

Long Multiple Status Bits
The value is contained in 2 consecutive Modbus registers. For example, if the first value is at address 30001 the value at 30002 will also need to be read.

Read each register as an unsigned integer. Take the first value and multiply by 65536. Then add the second value.

The result is composed of more than one status condition. This is accomplished by setting the appropriate bits for each status condition. See details below:

Monico Id	PID Description	Modbus Address	Manual Remarks
193	Warning Status	30203	Each of the first 24 bits represents warning status. 0 = Warning is NOT ACTIVE 1 = Warning is ACTIVE bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
194	Shutdown Status	30205	Each of the first 24 bits represents Shutdown status. 0 = Engine Shutdown is NOT ACTIVE 1 = Engine Shutdown is ACTIVE

Monico Id	PID Description	Modbus Address	Manual Remarks
			bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
195	Engine Derate Status	30207	Each of the first 24 bits represents Eng. Derate status. 0 = Engine Derate is NOT ACTIVE 1 = Engine Derate is ACTIVE bit 1 = High exhaust temperature bit 2 = High altitude (atmospheric pressure) bit 3 = Air filter plugged bit 4 = Engine overspeed bit 5 = Low engine coolant temperature bit 6 = High engine coolant temperature bit 7 = Low engine oil pressure bit 8 = High system voltage bit 9 = High engine inlet air temperature bit 10 = High engine oil temperature bit 11 = High hydraulic oil temperature bit 12 = No coolant flow bit 13 = High aftercooler coolant temperature bit 14 = High crankcase pressure bit 15 = Fuel filter plugged bit 16 = Oil filter plugged bit 17 = Not used bit 18 = Not used bit 19 = Low coolant level bit 20 = Alternator NOT charging bit 21 = Low fuel level bit 22 = High transmission oil pressure bit 23 = Low transmission oil pressure bit 24 = High transmission oil temperature bit 25-32 = Not used
196	Spare Outputs (GSC+ only)	30209	(writable) Bits 26-25 Spare Output, All other bit pairs are undefined. 0=OFF, 1=ON, 16=Output Fault, 17=Output not available
198	Relay Driver Module Relay State	30213	(writable) For each group of bits: 00 = OFF/DE-ENERGIZED; 01 = ON/ENERGIZED; 10 = Output fault; 11 = Output not available/ Don't change state. bits 1-2 = Undefined, future use bits 3-4 = Undefined, future use bits 5-6 = Undefined, future use bits 7-8 = Undefined, future use

Monico Id	PID Description	Modbus Address	Manual Remarks
			bits 9-10 = Output 9 bits 11-12 = Undefined, future use bits 13-14 = Undefined, future use bits 15-16 = Undefined, future use bits 17-18 = Output 5 bits 19-20 = Output 6 bits 21-22 = Output 7 bits 23-24 = Output 8 bits 25-26 = Output 1 bits 27-28 = Output 2 bits 29-30 = Output 3 bits 31-32 = Output 4
212	Generator Shutdown Status (GSC+ only)	30241	For each group of bits: 00 = Shutdown inactive; 01 = Shutdown active; 10 = Undefined; 11 = Not available, or not installed. bits 1-2 = Underfrequency bits 3-4 = Overfrequency bits 5-6 = Undervoltage bits 7-8 = Overvoltage bits 9-10 = Generator Frequency Sensing Fault bits 11-12 = Generator Total Overcurrent bits 13-14 = Single Phase Overcurrent bits 15-16 = Reverse Power bits 17-18 = Undefined, future use bits 19-20 = Undefined, future use bits 21-22 = Undefined, future use bits 23-24 = Generator Freq. Inconsistent w/Eng Speed bits 25-26 = Undefined, future use bits 27-28 = Undefined, future use bits 29-30 = Undefined, future use bits 31-32 = Undefined, future use
213	Generator Alarm Status (GSC+ only)	30243	For each group of bits: 00 = Alarm inactive; 01 = Alarm active; 10 = Undefined; 11 = Not available, or not installed. bits 1-2 = Underfrequency bits 3-4 = Overfrequency bits 5-6 = Undervoltage bits 7-8 = Overvoltage bits 9-10 = Generator Frequency Sensing Fault bits 11-12 = Generator Total Overcurrent bits 13-14 = Single Phase Overcurrent bits 15-16 = Reverse Power bits 17-18 = Undefined, future use bits 19-20 = Undefined, future use bits 21-22 = Undefined, future use bits 23-24 = Generator Freq. Inconsistent w/Eng Speed bits 25-26 = Undefined, future use bits 27-28 = Undefined, future use bits 29-30 = Undefined, future use bits 31-32 = Undefined, future use
255	High Exhaust Port Temp Deviating Low Warning	30286	Status indicated by bits. 0-4294967295 is Valid Range. Each of the first 24 bits represents warning status. 0 = Warning is NOT ACTIVE 1 = Warning is ACTIVE bit 1 = Exhaust Temperature Deviating Low bit 2 = Exhaust Temperature Deviating High
256	High Exhaust Port Temp Deviating Low Shutdown	30288	Status indicated by bits. 0 = Shutdown is NOT ACTIVE 1 = Shutdown is ACTIVE bit 1 = Exhaust Temperature Deviating Low bit 2 = Exhaust Temperature Deviating High

Appendix C: Modbus Viewer Program

A Modbus Viewer Program is offered as an option to allow easy Reading and Writing of CCM data located in the Translator Modbus addresses. A Freeware version that only reads Modbus registers is available for download from www.monicoinc.com/downloads.

Appendix D: GE Fanuc Version Notes

The GE Fanuc version gathers all Engine Data and creates a data map that is pushed to the PLC with the Gateway acting as the Master device. In this version, like all the PLC versions, the gains have been applied and the units have been converted to US unit. Metric Unit versions are available upon request. This application of the gain and units conversion saves the programmer a great deal of time because it offers the values without needed math operations. This section is not meant to be a user guide for the PLC, just additional information useful for use of the CDL Gateway™ with the GE Fanuc Series 90 and Versamax Modular. If you have other GE Fanuc models, please consult the factory for custom versions available.

Address Block Descriptions

All values are written to Analog Input Registers. This block of registers is used because they are rarely used in the higher address ranges used by the Gateway. By starting at AI1001, we are attempting to prevent conflicts with existing code already written in the PLC. In GE Fanuc, there is not real difference in the Analog Input Registers and the Data Registers. However, the Data Registers are used for all timers and counters and in some instances are used extensively. Other Address Block ranges are available upon request.

Parameter Status Values

The four blocks for viewing which Parameters are available on your specific installation are setup in Registers AI2001-AI2xxx. It is not normally recommended that you continually monitor these values, but you can if so desired. After satisfactory installation, it is recommended that you disable this device to optimize performance. You can always enable the device in the future for troubleshooting purposes.

Parameter Raw Values

The four blocks for viewing raw CDL Values are mapped to AI2501-AI2907. These parameters are usually only used for troubleshooting purposes. It is recommended that you disable this device after satisfactory installation is achieved. This will optimize the performance of the CDL Gateway™. You can always enable the device again to see them in the future.

Appendix E: Allen Bradley Version Notes

Controller Tag Versions

The controller tag version is intended for use with ControlLogix and CompactLogix Allen Bradley models. The controller tags can be created in the PLC, exported via CSV file, and imported into MonicoView, or as in the case with the Standard Factory versions simply create our standard Controller Tags, listed in the Combine Data Map, in the PLC program and the parameters will be pushed to the PLC under these tag names.

Address Block Descriptions

Since the ControlLogix series of PLC does not use the same addressing system as the PLC-5 and SLC, we need to use the Native Data Tag system. We must create one TAG ARRAY for each type of data. So we use three tag arrays labeled …INT(x), …DINT(x), and …REAL(x) representing Integers (INT), Double Integers (DINT) and Floating Point values (REAL). Each array will have multiple ELEMENTS represented by (x). For example, to represent Generator Set #1, parameter one might be GenSet1_INT(0) which would represent ELEMENT #0 of the INTEGER array for the DEVICE GenSet1. This tag would be mapped to a particular Raw value or Calculated value depending on the version. In MonicoView this could be shown mapped as shown in figure E.1 below. **MAKE SURE YOU HAVE AT LEAST AS MANY ELEMENTS IN YOUR CONTROLLER TAG IN THE PLC AS WE HAVE MAPPED. IF YOU HAVE TOO MANY, IT IS OK. HOWEVER, IF YOU HAVE ONE LESS ELEMENT THAN MAPPED IN MONICOVIEW, COMMUNICATIONS ERRORS WILL RESULT.**

Figure E.1: Parameter Mapping

An example of the overall mapping using the other two data types is shown in E.2 below:

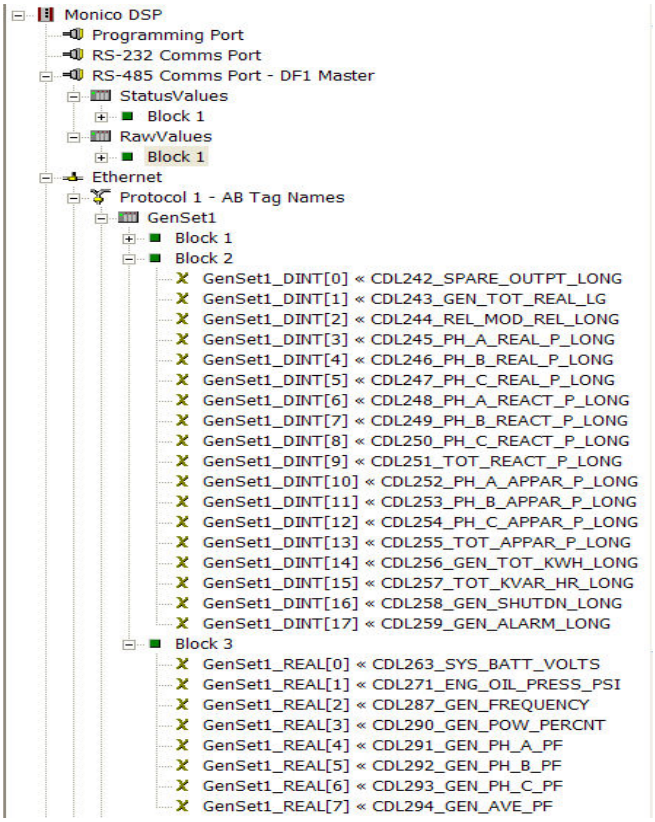


Figure E.2: Data Mapping Example

SLC, MicroLogix, and PLC-5 Style Versions

Since the SLC series do not support the Double Integer data type, these 32 bit integers are placed in the Floating Point registers. In most cases, the Gateway acts as a DF1 Master and ***pushes*** the engine data into the mapped data registers in the PLC, but it can read data from the PLC as well. In most cases, the Gain and Unit Conversions (For US units) are already done which saves substantial programming time in the PLC. Please refer to the latest Combined Data Map available for download at:

www.monicoinc.com\downloads.

One limitation to be remembered is that Allen Bradley does not allow more than 256 elements under each section. So, if you choose N107:0000 as the starting address, then N107:0255 is the last valid element. Also, the register ID “07 (as in N07:0000) is reserved for 16-bit Integers only. The register ID “08” is reserved for the first Floating Point group (as in F08:0000). Higher numbers above these two values can be used for any data type. Communications with MicroLogix 1100 over Ethernet must use the DF1 Master over PCCC/IP option.

Appendix F: Siemens Notes

In versions programmed for Siemens S5 & S7, the Gateway normally uses the Data Block registers. We normally begin with DB1000:0000, so we do not have conflicts with existing programs. However, any Data Blocks can be used. In the PLC program, you must create the Data Blocks and define the names and Data Types. When Using TCP/IP, you must set the IP address of the Gateway, and the IP address and Slot Number of the PLC ***PROCESSOR***. The IP address of the Gateway is set after highlighting the ***ETHERNET*** port under the ***COMMUNICATIONS*** section in MonicoView. The target PLC address is set after highlighting the PLC Device in the communications section. The Gateway acts as a Master in this application and ***pushes*** the data into the PLC Data Blocks.

When we act as a Master **over Serial Networks**, the Gateway needs to be the only Master on the network. Therefore, when using PPI or MPI communications, you cannot use the Gateway **AND** a Siemens HMI, because both devices will be a Master and this will not work. In this case, your options are to install a CP343-1 Ethernet module, use the Gateway HMI version to replace the Siemens HMI, or upgrade the PLC processor to a version with onboard Ethernet.